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# JOURNAL OF Medical Education

PUBLICATION OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

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# Prevalence of Type A Behavior Among Undergraduate Students With Medical and Nonmedical Career Plans

*Edward W. McCranie, Ph.D., and Gwendolyn L. Lewis, Ph.D.*

The Type A behavior pattern, characterized by such traits as competitiveness, intense striving for achievement, overcommitment to job or vocation, impatience, and easily aroused hostility, has become widely known in recent years as a significant risk factor for coronary heart disease (1). As a consequence of the stresses and demands of medical training and practice, a number of writers have asserted that physicians are particularly prone to Type A behavior (2, 3). Since the Type A pattern includes personal qualities incompatible with the effective practice of medicine and potentially harmful to physicians' own health and well-being, it is important to assess the validity of this belief.

Some observers (4) believe that Type A behavior is instilled and/or reinforced during the undergraduate years as a result of the competitive pressures associated with getting into medical school. Indeed, the characteristics of the Type A pattern appear similar to those associated with the widely discussed but little documented "premedical syndrome" (5, 6). The purpose of the present study was to assess the prevalence of self-reported Type A behavior among premedical students and students pursuing other degree and career objectives. Because of the increase in the numbers of women entering medical school, a second purpose was to compare the prevalence of Type A behavior by gender and premedical status.

## Methods

Data for this study were collected as part of a larger, longitudinal research project investigating career plans and values among students from the 13 private liberal arts colleges in the Associated Colleges of the Midwest. A random sample of 2,534 students in the class of 1983 were mailed a survey questionnaire in the fall of 1981 (their junior year). Of these, 47.9 percent responded. These 1,184 respondents were divided into three groups: (*a*) those considered premedical students ($n = 150$) according to their stated degree and career goals; (*b*) those fulfilling all the premedical course requirements but not planning medical careers, almost all of whom were biology and chemistry majors ($n = 218$); and (*c*) all other students ($n = 816$). In the early winter of 1983 (that is, in the final months before their graduation) all the survey participants still enrolled were resurveyed. All the students previously classified as premedical ($n = 147$) and simple random samples of the students from the other two groups (95 biology and chemistry majors, 94 others) were sent the student version of the Jenkins Activity Survey (7) and a follow-up questionnaire about their degree and/or career plans. This disproportional sampling procedure was used to ensure an adequate sample of students in each group.

The student version of the Jenkins Activity Survey (JAS), a self-report measure of Type A behavior adapted from the adult version of the JAS, contains 44 items, 21 of which contribute to an overall Type A score (7). Type A responses to the 21 items are scored 1, and Type B (that is, non-Type A) responses are scored 0, with summed scores thus ranging from 0 to 21. The student JAS scale has been found to exhibit adequate internal consistency and test-retest reliability (8) and to predict significantly

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The study reported here was supported in part by grant no. 1398 from the Josiah Macy, Jr. Foundation.

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a variety of Type A behaviors, including striving for achievement, hostility, and sense of time urgency (7).

**Results**

Of the 336 students sent the JAS, 253 returned it, for a response rate of 75.3 percent. The respondents consisted of 118 premedical students, 73 biology or chemistry students, and 62 other students as classified by degree and/or career plans in 1981.

An examination of responses to the 1983 follow-up questionnaire revealed that a number of the students changed their degree and/or career plans from their junior to senior years. Reclassifying these students according to their highest degree plans in 1983 resulted in a total of 89 who planned careers in medicine, 63 who planned to pursue a nonmedical doctoral degree (that is, a Ph.D.-level degree in any field other than medicine), 44 who planned to obtain a master's degree, and 57 who planned to obtain a bachelor's degree only.

A two-way analysis of variance (ANOVA) was conducted to examine potential differences in JAS scores of the students by sex and career or degree group. The ANOVA yielded significant main effects for both sex (F[4,248] = 7.94, $p = .005$) and degree group (F = 6.00, $p = .001$). There was no significant sex-by-degree group interaction. As shown in Table 1, the women scored higher than the men on the JAS scale; that is, they reported more Type A behavior than the men. A post-hoc comparison (Duncan's multiple-range test) of the four degree groups also indicated that the scores for Type A behavior in the medical and nonmedical doctoral groups were similar and significantly higher than the scores in the groups planning to achieve a master's or bachelor's degree.

**Discussion**

These results suggest that the premedical students were no more likely to exhibit Type A behavior than the students who planned to achieve doctoral-level training in nonmedical fields. This conclusion is consistent with other research (7) that found positive associations between Type A behavior and higher educational or occupational aspirations and attainments in general.

The observed gender difference in the present study is consistent with one other study (9), which found that women undergraduates at the University of Pennsylvania, nearly half of whom planned to attain advanced degrees, changed over the course of a semester toward significantly higher JAS scores than male undergraduates. The findings of that study and the present study raise the question of whether the environments of selective undergraduate colleges influence the development of greater

**TABLE 1**

**Mean Scores of Type A Behavior of 253 Seniors, by Gender, with Each of Four Degree Plans at 13 Undergraduate Colleges, 1983***

| Groups | Males | | | Females | | |
|---|---|---|---|---|---|---|
| | No. | Mean Score | S.D. | No. | Mean Score | S.D. |
| Medical degree | 54 | 8.4 | 3.3 | 35 | 10.1 | 3.9 |
| Nonmedical doctoral degree | 31 | 8.8 | 3.3 | 32 | 9.4 | 2.5 |
| Master's degree | 23 | 7.0 | 3.2 | 21 | 8.6 | 4.4 |
| Bachelor's degree | 24 | 6.8 | 2.3 | 33 | 7.5 | 3.4 |
| Total | 132 | 8.0 | 3.2 | 121 | 9.0 | 3.7 |

* The 13 schools were private, liberal arts colleges in the Associated Colleges of the Midwest. The students completed the Jenkins Activity Survey, which is described in the text; scores for Type A behavior range from 0 (no such behavior) to 21 (highest amount of such behavior).

Type A behavior among women or whether such institutions differentially select women with greater Type A tendencies.

In addition to replicating the present study in other undergraduate samples, systematic research should assess the prevalence, etiology, and health-related correlates of Type A behavior among medical students, residents, and physicians, and should examine the effects of such behavior on the quality of medical care. With increasing numbers of women pursuing medical careers, the present findings also suggest the need for further investigation of possible gender differences in the prevalence and correlates of Type A behavior among medical trainees and physicians.

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# A Survey of Journal Clubs in U.S. Family Practice Residencies

*Robert M. Heiligman, M.D., and Alison Okada Wollitzer, Ph.D.*

Bowers (1) suggested 35 years ago that the journal club "should be a part of the educational program at every hospital even if no interns or residents are assigned." In 1981 Geyman (2) recommended the "active use of journal clubs in Family Practice residencies, stressing the development of critical reading habits and the effective use of literature in patient care." Yet, only a single, indirect report of a family practice journal club exists (3).

The present authors conducted a survey of journal clubs in family practice (FP) residencies to identify the prevalence, mode of organization, content, and success of the clubs as appraised by residency program directors. Other objectives were to identify the factors associated with successful clubs and the clubs' educational goals and nonacademic functions.

## Methods

The sample studied consisted of all 388 family practice residencies in the United States. A questionnaire was mailed in February 1986, and a second mailing to nonresponding programs followed one month later. Demo-

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Dr. Heiligman is associate clinical professor, Department of Family and Community Medicine, University of California, San Francisco, School of Medicine, and Dr. Wollitzer is research coordinator, Santa Barbara Cottage Hospital, and program coordinator, Santa Barbara Medical Foundation Clinic, California.

Attendance by community physicians was significantly correlated with the respondents' ratings of satisfaction with the clubs in the present study. However, the respondents did not seem consciously aware of this relationship, as judged by their low opinion of the importance of community physicians' involvement. In fact, less than one in seven of the clubs offered continuing medical education credit.

## Conclusion

Any residency program planning to start a journal club must determine what constitutes the proper balance among socialization, practicality, and scholarship. The most successful clubs allow for the contributions of a heterogeneous group of participants. Having interested faculty and community physicians as role models for the residents seems particularly important. Journal club functioning may also be enhanced by designating a leader and setting standards of attendance. These educational sessions are highly adaptable and can operate successfully in a wide variety of residency settings. The journal club remains an important tool in graduate medical education.

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# Attitudes of Faculty Members, Residents, Students, And Community Physicians Toward Health Promotion

*Mary M. Horowitz, M.D., James C. Byrd, M.D., and Harvey W. Gruchow, Ph.D.*

A growing body of evidence links personal behaviors to many chronic diseases and increased mortality (1, 2). The 1979 U.S. surgeon general's report (3) identified the following behavioral changes as desirable to promote health in the American population: elimination of smoking; decreased consumption of alcohol, excess calories, saturated fat, cholesterol, salt, and sugar; increased exercise; periodic health screening; and regular use of seatbelts.

Physicians, through delivery of routine medical care, have an opportunity to influence the personal health habits of their patients. Several studies (4–6) have demonstrated, how-

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ever, that while community physicians consider it important for patients to modify their behavior, they do not spend much time counseling them to do so. Medical education places little emphasis on health counseling. Physicians leave their residencies feeling undertrained in patient management and unprepared to counsel patients regarding behaviors that affect their health (7, 8). The emphasis in academic health centers on inpatient care, complex illnesses, and "high tech" medicine may fail to convey to trainees the importance of personal behaviors for the health of the average person.

If society expects physicians to intervene more to modify their patients' behavior and thereby promote health, it must ensure that they are trained to do so. Such training requires medical school faculty members who believe that changing patients' behavior is desirable and who are themselves skilled in counseling. The purpose of the study reported here was to determine the attitudes toward health promotion of a group of academic physicians involved in teaching residents and students and to determine whether these attitudes differed significantly from those reported by medical students, residents, and community physicians.

## Methods

In 1985 a questionnaire modified from that used by Wechsler and colleagues (4) was distributed to all full-time faculty members in the Department of Medicine and all freshman medical students at the Medical College of Wisconsin and to all internal medicine residents in the Medical College of Wisconsin Affiliated Hospitals. Eighty-nine (84 percent) of the 106 faculty members, 91 (97 percent) of the 94 residents, and 194 (96 percent) of the 202 students returned completed questionnaires.

The questionnaire asked the respondents whether they felt is was worthwhile to attempt to modify patients' behavior to minimize risk factors; to rate each of 22 specific behaviors for their importance in promoting the health of the average person; to describe how prepared they felt to counsel patients regarding smoking, alcohol use, diet, exercise, and stress. Responses were given on a 4-point Likert-type scale ranging from 1 = definitely to 4 = definitely not, from 1 = very important to 4 = very unimportant, and 1 = very prepared to 4 = very unprepared, respectively. Scores for community physicians were derived from reports published by Wechsler and colleagues (4) of physicians in Massachusetts and Sobal and colleagues (5) of physicians in Maryland.

The mean scores for each group of respondents were compared using the Mann-Whitney test, which does not require the assumption of a normal distribution of responses. The mean scores for feeling prepared to counsel patients were tested for a linear trend with increasing level of training.

## Results

The average age of the respondents was: students, 24.3 (S.D. = 3.5); residents, 28.2 (S.D. = 2.7); faculty members, 42.9 (S.D. = 10) years. Sixty-four percent of the students, 81 percent of the residents and 89 percent of the faculty members who responded were male. The median year of graduation from medical school for faculty members was 1971.

Most respondents (98 percent) felt that it was definitely (73 percent) or probably (25 percent) worthwhile to modify patients' behavior in order to minimize risk factors. Table 1 lists the mean scores given the 22 behaviors by each group of respondents and the mean scores from the two previous surveys of community physicians. Most in each group felt that it was very important to eliminate cigarette smoking. There was little agreement regarding other items, however.

The students attributed significantly more importance than did the faculty members to 10 of the 22 behaviors and less importance only to use of seat belts. The residents were more similar to faculty members than to the students in that they attributed significantly more importance than the faculty members to only five behaviors and less to only one. Of the community physicians, the Massachusetts physicians attributed significantly more importance than did faculty members to 11 behaviors, and the Maryland physicians attrib-

### TABLE 1

**Mean Scores of the Importance of 22 Behaviors in Affecting Patients' Health as Rated by Internal Medicine Faculty Members and First-Year Students at the Medical College of Wisconsin and Internal Medicine Residents Affiliated with the College and by Community Physicians in Massachusetts and Maryland, 1985***

| Behaviors | Faculty Members (*n* = 86) | Residents (*n* = 91) | Students (*n* = 194) | Massachusetts Physicians† (*n* = 433) | Maryland Physicians‡ (*n* = 1487) |
|---|---|---|---|---|---|
| Eliminate cigarette smoking | 1.04 | 1.02 | 1.09 | 1.08 | 1.03 |
| Always wear seat belts | 1.35 | 1.35 | 1.72†† | 1.54 | 1.25 |
| Wear protective equipment/clothing around harmful substances | 1.43 | 1.48 | 1.45 | § | 1.11** |
| Eliminate cigar smoking | 1.61 | 1.77 | 1.56 | 1.98†† | 1.65 |
| Avoid excess caloric intake | 1.71 | 1.51 | 1.85 | 1.32** | 1.18** |
| Know drug contents and side effects | 1.73 | 1.81 | 1.66 | 1.56** | 1.35** |
| Drink alcohol moderately | 1.77 | 1.67 | 1.90 | 1.70 | 1.47 |
| Eat balanced diet | 1.84 | 1.70 | 1.63** | 1.49** | 1.24** |
| Eliminate pipe smoking | 1.87 | 1.95 | 1.67** | 2.04 | 1.72 |
| Avoid high-cholesterol foods | 1.92 | 1.77 | 1.76** | 1.95 | 1.70** |
| Avoid unnecessary X rays | 1.99 | 2.20†† | 1.63** | § | 1.45** |
| Avoid saturated fats | 1.96 | 1.94 | 1.86 | 1.75** | 1.47** |
| Minimize salt intake | 2.08 | 1.85** | 2.07 | 1.72** | 1.68** |
| Avoid undue stress | 2.14 | 2.04 | 1.81** | 1.86** | 1.66** |
| Exercise three times a week | 2.20 | 1.87** | 1.98** | 2.05 | 2.02 |
| Limit caffeine intake | 2.40 | 2.35 | 2.28 | 2.20** | 2.01** |
| Get seven hours sleep a night | 2.56 | 2.48 | 2.39 | § | 1.94** |
| Eat breakfast daily | 2.58 | 2.48 | 2.48 | 2.16** | 1.93** |
| Minimize sugar intake | 2.65 | 2.41** | 2.33** | 2.20** | 2.24** |
| Practice relaxation methods | 2.73 | 2.46** | 2.23** | 2.45** | 2.15** |
| Have an annual physical examination | 2.81 | 2.25 | 1.95** | 2.36** | 2.02** |
| Take vitamins | 3.34 | 3.07** | 2.70** | 3.37 | 3.10** |

* Respondents rated the importance on a scale of 1 = very important, 2 = important, 3 = unimportant, and 4 = very unimportant.

† Scores reported by Wechsler and colleagues (4).

‡ Scores reported by Sobal and colleagues (5).

§ Item not included in questionnaire.

** Rated as significantly more important than rated by faculty members (Mann-Whitney, $p < .05$).

†† Rated as significantly less important than rated by faculty members (Mann-Whitney, $p < .05$).

uted more importance to 16 behaviors. The behaviors felt to be more important by community rather than faculty physicians included avoiding excess calories, eating a balanced diet, avoiding saturated fats, and minimizing salt intake.

Of the three groups of respondents surveyed at the college, the students were least likely, the residents more likely, and the faculty members most likely to feel prepared to counsel patients regarding smoking, alcohol, diet, and exercise ($p$ for linear trend $< .01$). The faculty members were no more likely than the trainees to feel prepared to counsel about stress. The percentages of faculty members who felt very prepared to counsel patients were 43 percent for smoking, 34 percent for alcohol, 24 percent for exercise, 22 percent for diet, and 13 percent for stress. The mean scores indicated that the faculty members felt significantly less prepared than the Massachusetts community physicians to counsel patients regarding smoking (1.62 versus 1.45, respectively; $p < .02$), alcohol (1.74 versus 1.56, respectively; $p < .02$), diet (2.05 versus 1.71, respectively; $p < .001$), exercise (1.93 versus

1.67, respectively; $p < .001$), and stress (2.45 versus 1.85, respectively; $p < .0001$).

## Discussion

It appears from the data presented here that academic physicians were less likely than the community physicians to attribute importance to many of the behavioral changes advocated by the surgeon general. Moreover, increasing level of training was associated with a decrease in the importance attributed to promotion of healthful behaviors. Although the value of some of the behaviors listed is debated, the faculty members attributed less importance than the trainees or community physicians to a number of healthful habits, such as regular exercise and avoiding saturated fat, that have substantial support in the medical literature. The less favorable attitude of both faculty and house staff members may be due to the type of patients cared for in academic medical centers, which serve a disproportionate number of patients with advanced and complicated health problems. Measures that have as their primary aim prevention of disease may assume less importance in this setting. In addition, most teaching takes place on inpatient wards where diagnostic and therapeutic interventions routinely take precedence over patient education, especially where early discharge is encouraged. In the authors' opinion, disturbingly few of the faculty members felt very prepared to counsel patients. If teaching faculty members neither feel that health promotion is important nor feel prepared to counsel their patients regarding lifestyle changes, it will continue to be difficult for students and residents to become competent health counselors.

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# Predictive Validity of Specialty Choice Data From AAMC Graduation Questionnaire

*Thomas H. Dial, Ph.D., and Diane W. Lindley*

**Abstract**—Several previous studies have used data from the Association of American Medical Colleges' annual graduation survey to address questions about medical students' specialty preferences. Only recently, however, has it become possible to test the validity of these data as indicators of the specialties in which students will actually receive training. Comparisons of 1983 graduation questionnaire data with data on the third-year residencies for the same cohort reveal that the specialty preferences indicated on the questionnaire were good predictors of the residency programs the respondents were in during the third year following graduation.

The graduation questionnaire (GQ) of the Association of American Medical Colleges (AAMC) is administered annually to all senior medical students. GQ data have been used in a number of studies dealing with medical students' residency and specialty plans (1–4). A question raised by these studies concerns the proportion of medical school graduates who actually enter the specialties they indicated as preferred on the GQ. It has become possible only recently to answer this question tentatively.

## Methods

Two sources of data were used for the study reported here. Information on specialty plans was taken from the 1983 GQ. All 123 accredited M.D.-degree-granting medical schools in the United States participated in the 1983 survey, and the overall response rate was 66.3 percent of all U.S. medical school seniors. The GQ asks students who have decided on a definite specialty to report that choice and asks those undecided about a specialty to list their first three choices. The term "specialty preference" refers to the definite choices of those who said they had definite specialty plans and to the first choices of those who said they were undecided.

Data on residencies were obtained from the National Residency Matching Program (NRMP), which collects information on residents from teaching hospitals annually. The 1983 graduation class was the first for which it was possible to track GQ respondents through their residency training because NRMP data on residency training was added to the AAMC Student and Applicant Information Management System data base beginning with the 1983 class.

A file containing both the 1983 graduates' responses to the GQ and the resi-

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dency data for their first three postgraduate years (PGYs) was created for use in this study. The data presented here were taken from that combined file and from the separate files from which it was made.

## Results

Table 1 shows the distribution of the responses to the GQ question on preferred specialty, with subspecialties subsumed under 21 appropriate general specialties, and the analogous distribution for postgraduate-year-3 (PGY-3) residents in 1986. The question addressed by the comparison of the two distributions was whether an accurate estimate could be made based on GQ data of the proportions of graduates in a given year who would be in each respective residency category three years after graduation. This question disregarded whether the individuals who stated a particular specialty preference on the GQ were the same individuals who actually entered residencies leading to that specialty. Thus, it can be called a question about predictive validity at the aggregate as opposed to the individual level.

The percentage of PGY-3 residents in internal medicine in 1986 exceeded the percentage of GQ respondents who said in 1983 that they preferred internal med-

**TABLE 1**

**Numbers and Percentages of 9,533 U.S. Medical Students in the 1983 Graduating Classes Who Preferred Each of 21 Specialties and Numbers and Percentages of 14,887 Third-Year Residents in 1986 Who Were in These Specialties***

| Specialty | Students | | Residents | |
|---|---|---|---|---|
| | No. | Percentage | No. | Percentage |
| Allergy and immunology | 30 | 0.3 | 0 | 0.0 |
| Anesthesiology | 457 | 4.8 | 814 | 5.6 |
| Dermatology | 127 | 1.3 | 114 | 0.8 |
| Emergency medicine | 263 | 2.8 | 280 | 1.9 |
| Family practice | 1,444 | 15.1 | 2,004 | 13.8 |
| Internal medicine | 2,087 | 21.9 | 4,057 | 27.9 |
| Neurosurgery | 97 | 1.0 | 107 | 0.7 |
| Neurology | 146 | 1.5 | 197 | 1.4 |
| Nuclear medicine | 6 | 0.1 | 3 | 0.0 |
| Obstetrics-gynecology | 718 | 7.5 | 1,011 | 7.0 |
| Ophthalmology | 337 | 3.5 | 377 | 2.6 |
| Orthopedic surgery | 540 | 5.7 | 552 | 3.8 |
| Otolaryngology | 198 | 2.1 | 229 | 1.6 |
| Pathology | 252 | 2.6 | 418 | 2.9 |
| Pediatrics | 762 | 8.0 | 1,352 | 9.3 |
| Physical medicine and rehabilitation | 73 | 0.8 | 143 | 1.0 |
| Preventive medicine | 18 | 0.2 | 12 | 0.1 |
| Psychiatry | 450 | 4.7 | 761 | 5.2 |
| Radiology | 525 | 5.5 | 777 | 5.3 |
| Surgery | 852 | 8.9 | 1,145 | 7.9 |
| Urology | 151 | 1.6 | 185 | 1.3 |
| Total | 9,533 | 100.0 | 14,538 | 100.0 |

* Data on the students were from the 1983 Graduation Questionnaire of the Association of American Medical Colleges (AAMC), and data on the residents were from the AAMC Student and Applicant Information Management System. Data were unavailable on 948 students and 2,634 residents.

icine by 6.0 percentage points, the largest difference in the comparison. Conversely, in most other instances the percentage of residents in a particular residency category during PGY-3 was slightly smaller than the percentage of GQ respondents who stated a preference for that category. The percentage of graduates for whom PGY-3 residency data were unavailable, either because their status was unknown or because they were not in any residency program, was also larger than the percentage of GQ respondents who failed to provide specialty preference data. The Pearson product-moment correlation between the two distributions is .96, a finding that indicates an extremely strong similarity between the two distributions.

Table 1 shows that GQ data on specialty preference provide very respectable preliminary estimates, at least at the general specialty level, of the relative proportions of U.S. medical school seniors who actually will enter various residency programs and remain in those programs at least through PGY-3. The accuracy of a predictive model based on GQ data could perhaps be improved by making use of supplementary data, such as information on the position-to-candidate ratios in the various residency categories.

Table 2 displays data on GQ respondents for whom PGY-3 data were available ($n = 8{,}250$). It shows the overall percentage and the percentage in each of 21 specialty-preference categories of those who were in residencies leading to their preferred specialties as of PGY-3. Altogether, 87.2 percent of the graduates were in residencies consistent with the specialty preferences they had indicated on the GQ. In five of the 21 specialty-preference categories, the degree of consistency was 90 percent or greater. The two categories that contained the largest numbers of residents, family practice and internal medicine, were among those five.

**TABLE 2**

**Percentages of 1983 U.S. Medical School Graduates Who Preferred Each of 21 Specialties Who in 1986 Were in Residencies Leading to Their Preferred Specialty***

| Specialty | Percent (n = 8,250) |
|---|---|
| Allergy and immunology | 0.0 |
| Anesthesiology | 89.4 |
| Dermatology | 63.3 |
| Emergency medicine | 65.0 |
| Family practice | 93.9 |
| Internal medicine | 92.9 |
| Neurosurgery | 74.1 |
| Neurology | 71.6 |
| Nuclear medicine | 0.0 |
| Obstetrics-gynecology | 87.1 |
| Ophthalmology | 86.5 |
| Orthopedic surgery | 74.3 |
| Otolaryngology | 79.9 |
| Pathology | 90.7 |
| Pediatrics | 92.3 |
| Physical medicine and rehabilitation | 88.4 |
| Preventive medicine | 25.0 |
| Psychiatry | 92.0 |
| Radiology | 88.0 |
| Surgery | 79.3 |
| Urology | 75.0 |
| Overall | 87.2 |

* Data on the students were from the 1983 graduation questionnaire of the Association of American Medical Colleges (AAMC), and data on the residents were from the AAMC Student and Application Information Management System.

In three specialty categories—preventive medicine, allergy and immunology, and nuclear medicine—fewer than 50 percent of those who gave these specialty preferences on the GQ were in PGY-3 residencies in the specialties. The lack of consistency between preference and actual residency in allergy and immunology is to be expected, as its certification requirements specify three years of preliminary graduate training in another field before beginning specialized training. The lack of consistency in preventive medicine and nuclear medicine may be explained by the fact that they were chosen by few graduates and because data were missing on many of the residents who had expressed preferences for these specialties.

In those cases where PGY-3 residencies were inconsistent with senior year preferences, the residents tended to move into residencies in internal medicine from their initial choices. The number of GQ respondents (1,283) whose PGY-3 status was unknown or did not correspond to any of the 21 listed residency categories was more than four times as great as the number (313) who stated preferences for other specialties on the GQ but were in internal medicine residencies in PGY-3.

## Discussion

The comparison of GQ and PGY-3 data reported here showed that specialty preference data from the GQ provide reasonably accurate preliminary indicators of the residencies that medical school graduates will enter, at least at the general specialty level, and in which they will remain at least through PGY-3. These GQ indicators offer an important advantage to researchers in that they are available three to four years before most of the graduates complete their residencies and enter practice. The disadvantage of this timeliness is a relatively small reduction in the precision and accuracy of prediction.

When the PGY-4 data for the class of 1983 become available, it will be possible to test the power of GQ data to predict correctly the graduates' subspecialty training.

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findings were 3 out of 3 (100 percent) for SP-1 and SP-2 and were 2 or 3 (67 to 100 percent) for SP-3. These overall results indicated that the information provided by SP-1 and SP-2 were consistently accurate while that provided by SP-3 were consistently less accurate. This last finding suggested that the quality of a simulation may be a function of the individual selected for the simulation. Given that minor inaccuracies could occur in live simulation, it is important to observe SPs frequently and adjust the simulation and, in the extreme, to modify the scoring of students' performance accordingly to account for inaccuracies in the simulation.

Given the limited number of observations, the present findings suggested that when different individuals are properly coached to simulate a patient problem, they can perform the simulation accurately and with a high degree of consistency even after repeated presentations during the course of a day. These findings can be further validated if the same study design could be applied to a large sample of patients and further improved by videotaping all student encounters so they can be reviewed for students' accuracy in recording information and hence for accuracy of the simulations themselves.

These findings are relatively important, since they may affect how best to schedule the SPs so that repetition and fatigue do not affect the accuracy of simulations. The schedule used for testing second-year medical students at SIU had each SP see a student every 25 minutes, with a 15 minute break after the third and ninth student and an hour for lunch after the sixth student. Each SP saw a total of 12 students in one day. Based on the results reported here, the authors suggest that 12 may be the maximum number of students an SP should encounter in one day. With appropriate coaching and use, the simulated-standardized patient can provide faculty members with a powerful and accurate technique to simulate and standardize live presentations of a case problem.

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# Deans' Attitudes Toward Teaching Psychopharmacology And Rational Prescribing in Medical Schools

*E. M. Sellers, M.D., Ph.D., Richard Wakeford, and Gail Somer*

It is widely recognized that modern drugs have played a major role in the revolution that has taken place over the last 40 years in the care of the mentally ill. The number of psychiatric patients requiring prolonged stays in hospital has been reduced, and treatment has become more humane. However, psychoactive drugs have not been free of problems. Concern from inside the health professions and elsewhere has been widespread and has resulted in many attempts to make prescribing of these substances more rational (1–5). In this context, rational prescribing is logical prescribing sup-

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ported by scientific research in contrast to prescribing practices that are not so supported.

The problem of inappropriate prescribing of psychoactive drugs so concerned the World Health Organization (WHO) that in 1982 its Executive Board requested its director-general to take a major initiative in the field. As part of a program of activities designed to involve member nations, drug manufacturers, and medical institutions, the Executive Board sought "to intensify efforts aimed at improving prescription, delivery and utilization practices regarding psychoactive drugs, through educational programmes for physicians and other health workers" (6). In connection with a small workshop within this program, the authors contacted the deans of all of the medical schools in Canada, the United Kingdom (U.K.), and the United States to assess their opinions of a possible initiative on improving the teaching of "rational prescribing of psychoactive drugs." The authors report the findings of this survey in the present paper.

## Methods

A 10-item questionnaire was devised and distributed in 1986. The items concerned the deans' feelings about the need for change in teaching prescribing of psychoactive drugs and about their likely response to initiatives for such change. Of 28 deans in the United Kingdom, 21 (75 percent) replied; however, only 19 of these completed questionnaires could be analyzed (68 percent). Of 143 deans in North America (N.A.) (Canada and the United States), 105 (73 percent) responded, and all were included in the analysis.

**TABLE 1**

**Percentages of 19 Medical School Deans in the United Kingdom and 105 Deans in North America (Canada and the United States) Who Gave Opinions on 10 Items Concerning the Teaching of Rational Prescribing of Psychoactive Drugs, 1986***

| Question | Agree | | No Opinion | | Disagree | |
|---|---|---|---|---|---|---|
| | U.K. | N.A. | U.K. | N.A. | U.K. | N.A. |
| Teaching left up to individuals by school | 74 | 84 | 5 | 5 | 21 | 11 |
| More needed to be done by medical schools | 64 | 60 | 0 | 17 | 36 | 23 |
| WHO educational advice not heeded by respondent | 16 | 22 | 32 | 46 | 52 | 32 |
| Respondent prepared to take initiative on changing teaching | 69 | 54 | 11 | 21 | 20 | 25 |
| Medical students' attitudes on prescribing no business of school | 5 | 3 | 11 | 4 | 84 | 93 |
| Respondent grateful for WHO's advice and recommendations | 47 | 59 | 21 | 32 | 32 | 9 |
| Guidance more effective if from licensing bodies | 68 | 64 | 11 | 11 | 21 | 25 |
| Broad specifications of aims and objectives for teaching helpful | 74 | 85 | 11 | 8 | 15 | 7 |
| Specific suggestions of methods and approaches for teaching helpful | 58 | 78 | 26 | 8 | 16 | 14 |
| No impact of WHO initiative at school | 31 | 13 | 16 | 32 | 53 | 55 |

* The questions were answered on a 5-point scale that was reorganized into the three categories of responses used here. The five responses were: "agree," "tend to agree," "no opinion," "tend to disagree," and "disagree."

## Results

Distributions and factor analysis of the responses were completed by use of SPSS-X summary statistics (7). Statistical analysis showed that the test items were reliable (Cronbach's alpha of 0.80). The data for Canada and the United States were combined because no differences between the responses were apparent and because the sample contained a small number of Canadian schools ($n = 16$). The five response categories were organized into three response categories: "agree" ("agree" and "tend to agree"), "no opinion," and "disagree" ("tend to disagree" and "disagree"). Table 1 presents the results.

Both the United Kingdom (74 percent) and North American (84 percent) deans agreed that "teaching of this subject is very much left up to individuals' and departments' inclinations." As to whether "medical schools should do more," 60 percent of the North American deans agreed, 17 percent had no opinion, and 23 percent disagreed. The opinions of the United Kingdom deans were more greatly divided; 64 percent agreed, and 36 percent disagreed. While their opinion as to whether medical schools should do more to teach rational prescribing was equivocal, the consensus of the U.K. deans was that it is a medical school's responsibility to develop students' attitudes on such matters. Substantial proportions of all deans (U.K., 69 percent; N.A., 54 percent) were prepared to undertake an initiative on such teaching, and a majority felt that specific suggestions on teaching methods and approaches would be helpful.

The deans' views of the WHO's role and impact presented several contrasts. A 59-percent majority of the North American deans reported they would be grateful for WHO's advice and recommendations (and only 9 percent disagreed), while the United Kingdom deans' opinions were more evenly divided (47 percent, "agree"; 32 percent, "disagree"). A majority in both groups felt that guidance in educational policy would have more effect if it came from licensure bodies.

## Discussion

Problems have been identified with respect to teaching rational prescribing: such teaching is not integrated into all appropriate courses and not coordinated from year to year in the curriculum; excess emphasis on lectures; and lack of opportunities for students to practice rational prescribing (3, 5, 6).

The deans' opinions reported in the present study give an important perspective on the likelihood that these problems can be addressed. Most of the deans felt that developing students' attitudes about rational prescribing of psychoactive drugs is an appropriate concern of medical schools. However, between 20 and 25 percent of them were not prepared to undertake an initiative on such teaching. In such schools the lack of the deans' support would likely preclude most major changes (8). Furthermore, recommendations, initiatives, and working groups from such international and remote organizations as the WHO apparently do not have impact locally. The deans' responses indicate that they would like general guidance and specific ideas but apparently were confronted with many local factors that must be considered. Traditional medical schools are typically organized by discipline and department. Psychopharmacology and rational prescribing do not fit into this structure because they cross many disciplines. Rarely are medical curricula organized to deal with such a multidisciplinary topic; by default, the teaching is left to individual instructors.

The implementation of curriculum change in medical schools must confront many practical problems, as described by the first author and colleagues in a paper presented at the First Cambridge Conference, an international workshop on clinical assessment held at Churchill College, Cambridge, England, in 1984. An alternative or complementary strategy for instituting change is suggested by the importance the deans assigned to direction from licensure and examination bodies. Those interested in increasing the extent of education in prescribing psychoactive drugs might focus on changing the content of licensing examinations.

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# An Interim Report on the MCAT Essay Pilot Project

*Judith Anderson Koenig and Karen J. Mitchell, Ph.D.*

**Abstract**—Results from four pilot administrations of the Medical College Admission Test essay question are reported. Analyses focused on (*a*) the performance characteristics of sample groups differentiated by gender, size of hometown, race/ethnicity, and dominant language; (*b*) the relationships between essay scores and academic/demographic characteristics; and (*c*) the reliability of one 45-minute versus two 30-minute essays. No differences were found for examinees grouped by gender and size of home community. Mean differences among the racial/ethnic groups were explained largely by reading level differences. Differences in essay performance by language group were large and unexplained by reading level differences. No relationship was found between the essay score and the academic/demographic characteristics. Reliability estimates for two 30-minute essays were higher than for one 45-minute essay; however, the 30-minute period yielded writing of poorer quality. Test-retest reliabilities for the 45-minute topics will remain the focus of future studies as will performance by examinees for whom English is a second language. The impact of the essay on the selection process will also be assessed.

The Association of American Medical Colleges is investigating the desirability and feasibility of including an essay as part of the Medical College Admission Test (MCAT). This endeavor, entitled the MCAT Essay Pilot Project, called for the administration of an essay on a trial basis with each of the spring and fall MCAT administrations in 1985, 1986, and 1987. The overall objectives of the project are to plan, develop, implement, and evaluate an essay written by MCAT examinees under standard conditions and in response to a topic developed with specific criteria.

The MCAT essay was administered in the spring and fall of 1985 and of 1986. The essay topics were designed to assess an examinee's skill in: developing a central idea; synthesizing concepts and ideas; separating relevant from irrelevant information; developing alternative hypotheses; presenting ideas cohesively and logically; and writing clearly and observing the accepted practices of grammar, syntax, punctuation, and spelling consistent with timed, first-draft composition.

Under the guidance of the Ad Hoc Advisory Committee to the MCAT Essay Pilot Project, an evaluation plan was developed to determine whether the essay should become a permanent part of the MCAT. The evaluation plan is divided into four phases, each containing two primary questions:

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Ms. Koenig is a research associate, and Dr. Mitchell is director, Medical College Admission Test Program, Section for Student and Educational Programs, Association of American Medical Colleges, Washington, D.C.

Phase 1—What is the nature of the information provided by an essay? What are the performance characteristics of various examinee groups?

Phase 2—What is the impact of the essay on the selection process? Is the information provided by the essay unique and useful in selecting students?

Phase 3—What effect does an essay on the MCAT have on undergraduate students' course selections? Does the presence of an essay on the MCAT affect the undergraduate curriculum or the types of applicants?

Phase 4—What are the costs associated with the development, administration, and distribution of an MCAT essay? What different methods (and their costs) are available for the evaluation and distribution of essays?

The data reported below provide preliminary information on phase 1 and part of phase 2 of the evaluation plan. The following research questions were addressed for each administration:

1. What are the performance characteristics of the total sample and of sample groups differentiated by gender, size of hometown, race, and dominant language?
2. What are the relationships between essay scores and such demographic/academic characteristics as age, years of postsecondary education, and selectivity of undergraduate college attended?
3. What are the relationships between essay performance and scores on the MCAT science and skills analysis tests?
4. What level of reliability can be achieved with an essay question?

## Method

With each MCAT administration in 1985 and 1986, an essay test was included. A 45-minute period was allotted for the essay during the first three administrations. The essay was expanded to 60 minutes in the fall of 1986. A different topic was used for each administration.

For each administration, a sample of examinees was selected to represent the demographic and academic characteristics of the MCAT examinee population as a whole. Papers for both initial and repeat examinees who indicated a preference for allopathic medicine were included in the samples. The sample essays were scored by readers from the California university system who were experienced in scoring for large-scale writing projects.

The essays were scored using a holistic approach that regards a piece of writing as a unit without subscores or separable aspects. A score is assigned based on a general impression of the overall quality of the entire paper using a scoring guide that explicates the characteristics of essays at each score level. The raters are trained to internalize the scoring guide and to minimize the effects of individual biases. The actual scoring does not begin until all readers are in close agreement during practice scorings of sample papers. Calibration exercises are performed prior to the actual scoring and approximately every two hours during the scoring to ascertain that all readers remain correctly focused in using the scoring guide.

The scoring room is arranged so that six to eight readers sit at one table. Assigned to each table is a "table leader." Table leaders are selected based on their experience with holistic scoring. Their job is to provide guidance to the scorers in their determination of scores. The rater training and scoring sessions were structured using White's (1) suggestions for organizing and managing holistic essay readings.

Essays were randomly sorted into groups of 20, and each batch was assigned at random to two readers. Each essay was rated on a 6-point scale by two readers; each reader assigned ratings without knowledge of the other rating. The two ratings on each essay were subsequently checked for score agreement. Papers receiving ratings that were more than a score point apart were given a third reading by one of the table leaders. In the instances of two readers, the final score was the sum of the two scores, resulting in a score ranging from 2 to 12. When a third reading was needed, the final score was determined by the table leader and was usually the sum of the third score and one of the first two scores.

The first three MCAT essay administrations contained one essay question. In the fourth administration, in the fall of 1986, all examinees were asked to write on two essay topics. The scoring procedure for this administration was identical to previous scorings except that the final scores for each topic were averaged to produce a score consistent with scores in the previous administrations. Again, the score scale ranged from 2 to 12.

Means and standard deviations for essay scores were calculated separately for students grouped by gender, race/ethnicity, size of hometown (less than or more than 10,000 population), and dominant language for each administration. Examinees were grouped into four racial/ethnic groups by their self-identification as white, black, Asian/Pacific Islander, or Hispanic. Those who described themselves as Mexican American, mainland Puerto Rican, or other Hispanic were included in the Hispanic category. Since the number of Native American examinees was so small, data for this group were not reported. The two language groups consisted of commonwealth Puerto Ricans and all others. Because the MCAT does not ask examinees to indicate their native language, it was thought that the commonwealth Puerto Rican group would be likely to contain large numbers who spoke English as a second language. Since preliminary examination of the data revealed differences by racial/ethnic group and by language group (that is, between commonwealth Puerto Ricans and all others), average essay scores were computed for students divided into groups by their scores on the MCAT skills analysis: reading subtest to determine whether the differences in essay scores observed between racial/ethnic and language groups were attributable to differences in average reading levels. An analysis of covariance was performed with race/ethnicity as the independent variable and the reading subtest score as the covariate. The reading score was chosen as a covariate because the reading subtest and the essay question are designed to assess some of the same skills and because the reading score was the most highly correlated of all subtests with the essay.

Means and standard deviations for essay data were also computed for examinees grouped by number of semester hours of English, undergraduate major, self-ratings of writing and reading ability, and the selectivity of the undergraduate college. Self-rating of reading and writing was assessed by responses to questions in the MCAT registration packet asking for a comparison of the student's own ability with that of other college students. A 5-point scale was used consisting of the following choices: below average, average, above average, top 10 percent, and top 1 percent. Pearson's product-moment correlations were used to determine the relationships between essay scores and these variables.

The relationships between the six MCAT subtests and the essay were also examined using Pearson's product-moment correlations. Simultaneous multiple regression analysis was employed to determine the degree to which the essay score could be predicted from the current six-test battery. Reliability estimates were obtained using generalizability theory techniques (2, 3).

### Results for Spring 1985–Spring 1986

Essay results for the spring 1985, fall 1985, and spring 1986 examinees (who wrote one 45-minute essay) appear in Figure 1. (The results for the fall 1986 sample are discussed in the next section.) The mean score for the spring 1985 sample of 3,118 was 6.8; for the fall 1985 sample of 1,639 it was 7.6; and for the spring 1986 sample of 4,074 it was 7.1. The standard deviations for the three testings ranged from 1.6 to 1.7. In each case, the data were normally distributed, and all score points were represented.

Group data for all three samples are presented in Table 1. Group differences were negligible for gender and size of hometown but were somewhat larger for race/ethnicity and dominant language. The rank orders of the groups were similar across the three administrations.

Results from the analyses of covariance indicated that a significant amount of the variation in essay performance among the racial/ethnic groups was due to differences in reading level. Analysis of covariance also allows comparison of group means with the overall mean while controlling for reading level. Examination of the means adjusted for reading level revealed that the differences between the adjusted group mean and the adjusted overall mean ranged from −.25 to .20 of a score point for blacks (*n* = 173, 163, 263, respectively for the three administrations), .09 to .30 for whites (*n* = 2244, 991, 3051), −.02 to −.38 for Hispanics (*n*

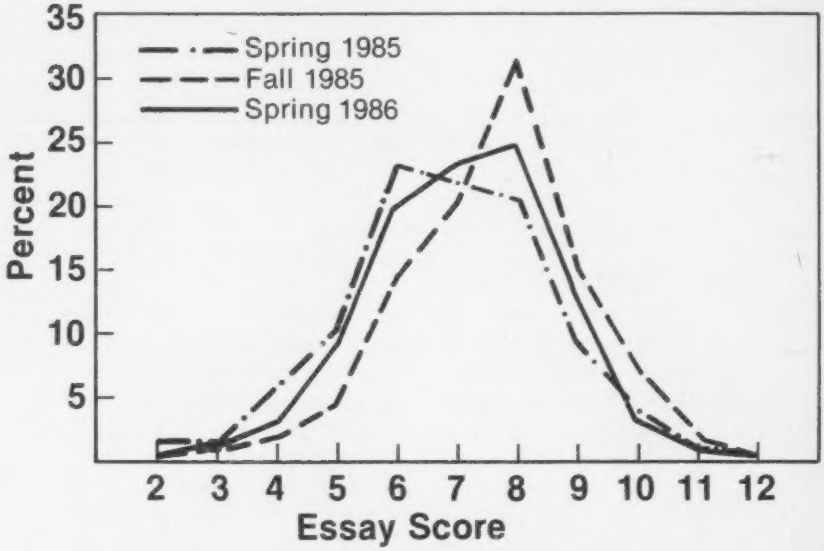

Figure 1

Percentages of representative sample groups of examinees (spring 1985 = 3,118; fall 1985 = 1,639; and spring 1986 = 4,074) at each score level on the essay for three administrations of the Medical College Admission Test.

**TABLE 1**

**Numbers of Sample Group Examinees and Their Essay Scores for Three Administrations of the Medical College Admission Test, by Four Characteristics***

| Characteristics | Spring 1985 | | | Fall 1985 | | | Spring 1986 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean Score | S.D. | No. | Mean Score | S.D. | No. | Mean Score | S.D. | No. |
| Gender | | | | | | | | | |
| Male | 6.8 | 1.7 | 1,971 | 7.5 | 1.5 | 934 | 7.0 | 1.6 | 2,544 |
| Female | 7.0 | 1.7 | 1,147 | 7.7 | 1.6 | 705 | 7.3 | 1.5 | 1,530 |
| Hometown size† | | | | | | | | | |
| Less than 10,000 | 6.8 | 1.7 | 474 | 7.6 | 1.6 | 246 | 7.0 | 1.5 | 689 |
| More than 10,000 | 6.8 | 1.8 | 2,336 | 7.6 | 1.6 | 1,134 | 7.1 | 1.5 | 2,981 |
| Race/ethnicity‡ | | | | | | | | | |
| Black | 5.9 | 1.6 | 173 | 6.9 | 1.5 | 163 | 6.4 | 1.6 | 263 |
| White | 7.1 | 1.6 | 2,244 | 7.9 | 1.4 | 991 | 7.3 | 1.4 | 3,051 |
| Hispanic | 6.5 | 1.7 | 348 | 6.9 | 1.7 | 166 | 6.6 | 1.5 | 152 |
| Asian | 6.6 | 1.9 | 269 | 7.6 | 1.7 | 146 | 6.9 | 1.7 | 392 |
| Language§ | | | | | | | | | |
| Commonwealth Puerto Rican | 3.7 | 1.6 | 66 | 4.4 | 1.5 | 158 | 4.1 | 1.6 | 188 |
| Others | 6.8 | 1.7 | 3,052 | 7.6 | 1.5 | 1,481 | 7.1 | 1.5 | 3,886 |

* The sample groups were representative of the examinee pool as a whole; both first time and repeat examinees who indicated a preference for allopathic medicine were included. The sample sizes were: spring 1985 = 3,118; fall 1985 = 1,639; and spring 1986 = 4,074.

† Numbers do not add to the total sample size because of incomplete examinee records.

‡ Race/ethnicity was based upon self-identification on the MCAT. Hispanics included Mexican Americans, mainland Puerto Ricans, and other Hispanics. Not all races are listed.

§ The commonwealth Puerto Rican examinees were considered to speak English as a second language; all others were considered to be native English speakers.

= 348, 166, 152), and −.10 to .07 for Asians ($n$ = 269, 146, 392). Hence, even though there were differences in essay performance by racial/ethnic group, these differences decreased when basic skills or reading levels were considered. However, the commonwealth Puerto Ricans, ($n$ = 66, 158, 188) scored 1.75 to 2.00 points below the adjusted overall mean essay score. Factors other than reading level differences may have contributed to these examinees' lower performance.

The type and magnitude of differences among racial/ethnic groups were similar for all three administrations. However, the mean essay score for all racial/ethnic groups in the spring 1986 sample improved slightly over prior administrations when reading level was held constant. This improvement may have resulted from the availability of practice materials and topics distributed from previous administrations.

No relationship was found between essay performance and age, years of postsecondary education, and number of semester hours in English courses. The relationship between essay performance and number of English semester hours may have been obscured by an inability to identify course hours for remediation or reinforcement and those for advanced English courses. The humanities and social science majors had higher mean scores than examinees with other majors. There was a positive relationship between essay scores and examinees' self-ratings in writing and reading. The examinees, thus, proved to be good judges of their writing ability. There was also a positive relationship between essay performance and college selectivity. Students from selective undergraduate institutions received higher essay scores, and those from less selective schools received lower scores. Selectivity was defined by the average combined Scholastic Aptitude Test score for all students at an institution, as discussed by Astin (4). Astin index data for 1977 were used in the present study, as it was the most recent available.

Correlations between the essay and other MCAT subtests are shown in Table 2. Correlations between the essay and science areas ranged from .25 to .30, whereas those between the essay and skills analysis tests were higher. The reading subtest had the highest correlations with the essay, with coefficients that ranged from .42 to .49. The correlations in Table 2, however, were lower than those observed among the six MCAT subtests themselves; those correlations ranged from .51 to .87. These correlations indicate that the essay was measuring skills different from those assessed by the MCAT six-test battery.

When essay scores were predicted from data for the six MCAT subtests, the multiple correlations ranged from .44 to .49 for the three essay administrations. That is, from 19 to 25 percent of the variance in the essay score distribution overlapped with variance in the subtests. It is worth noting that the simple correlation between the reading subtest score and the essay score was of the same magnitude as the multiple correlation between the six subtest scores and the essay score. This similarity was due to the high intercorrelation among the four MCAT science subtests and their low correlation with the essay. When these four scores are considered jointly with the two skills analysis scores, very little unique information is added, and the multiple correlation remains in the same range as the simple correlation.

The interrater reliabilities for all three essay scorings ranged from .72 to .73. These estimates indicate the amount of variation in the essay scores that was attributable to the differences in the examinees' writing ability rather than to such sources of error as differences among readers or time or day of scoring (5). The reliability estimates do not address differences in performance due to variation in

**TABLE 2**

**Correlations Between Essay Scores and Subtest Scores of Sample Groups of Examinees for Three Administrations of the Medical College Admission Test***

| Subtests | Essay | | |
|---|---|---|---|
| | Spring 1985 | Fall 1985 | Spring 1986 |
| Biology | .29 | .30 | .27 |
| Chemistry | .28 | .27 | .25 |
| Physics | .27 | .26 | .26 |
| Science problems | .29 | .29 | .30 |
| Skills analysis: reading | .43 | .49 | .42 |
| Skills analysis: quantitative | .38 | .37 | .36 |
| All subtests | .45 | .49 | .44 |

* The sample groups were representative of the examinee pool as a whole; first-time and repeat examinees indicating a preference for allopathic medicine were included.

the content or skill requirements of different topics.

### Results for Fall 1986

Results from the three administrations presented above suggested that additional research was needed on the development of essay topics that are comparable in difficulty and in assessing prerequisite skills. Test-retest reliabilities for small samples of examinees and differences among the mean essay scores for the three administrations indicated that changes in the format or focus of essay questions were warranted. Testing of four essay topics differing in focus and length of response was undertaken with the fall 1986 MCAT administration. Each topic was paired once with every other topic and administered in a 30-minute time period. Counterbalancing was used so that each topic appeared as the first and the second essay. This produced 12 different topic combinations. The examinees wrote two different essays, and the essay testing time was increased to 60 minutes. Each topic was also administered in a 45-minute time period. Two of the four topics were shortened to be 15-minute essays. These were paired with the 45-minute essays so that testing time would also be 60 minutes. In this case, the 45-minute essay was always administered first. Random samples of testing centers were selected for the 30/30- or 45/15-minute forms. It was hypothesized that the administration of two topics would lead to a better evaluation of the skills measured by essay writing and, hence, would result in increased reliability and comparability of essay data. Analyses were planned to answer two questions: (*a*) Could 45-minute questions be developed that were similar in difficulty and in skills assessed across administrations? (*b*) Would the administration of a 60-minute essay component with two 30-minute topics lead to sufficient comparability and reliability of essay data?

The fall 1986 data revealed that the same topic administered in a 45- and 30-minute time period elicited a wide range of response. Essays written in the 15-minute period were not scored. Mean scores for the 45-minute topics ranged from 7.1 to 7.7. Test-retest reliabilities were calculated for each of the four 45-minute topics on samples of repeating examinees who sat for both the spring and fall administrations in 1986 ($n = 139$ to 179). The four reliability estimates ranged from .36 to .58.

Mean scores for the 60-minute format ranged from 7.1 to 7.4, with reliability coefficients ranging from .60 to .81. These reliability estimates were based on split-half and generalizability coefficients. Test-retest reliability estimates were not available for the 60-minute format because this test format was not administered prior to fall 1986. However, test-retest reliabilities can be extrapolated from these estimates and would generally be expected to exceed those of the 45-minute format and fall in the low 70s.

### Discussion

The statistical characteristics of the 1985 and 1986 essays considered by administration were encouraging. No average score differences were evident between examinees grouped by the various academic/demographic characteristics. There were differences for examinees grouped by racial/ethnic status, but these differences were largely related to reading level. Larger differences in mean scores were found between examinees grouped by language (commonwealth Puerto Ricans and all others), and these differences were not explained by the variance in reading level. The correlations between the essay and the other MCAT subtests indicated that the essay was assessing a skill or skills unexamined by the other tests.

The interrater reliabilities were at acceptable levels. Test-retest reliabilities for the 45-minute topics were low, while the split-half reliabilities between the two 30-minute essays within the 60-minute format administered in fall 1986 were encouraging. These split-half reliabilities were sufficiently high to expect test-retest reliabilities for 60-minute formats to reach acceptable levels. However, the 45- and 30-minute topics elicited papers of notably different quality. The 45-minute period seemed to allow for fuller treatment of issues and more complete argument development. The skills involved in organizing and presenting ideas and sustaining a line of reasoning were demonstrated better in a 45-minute than in a 30-minute period. The 30-minute topics produced papers with more simplistic arguments and increased numbers of surface errors (such as, punctuation and word usage). The quality differences between 45- and 30-minute topics were not reflected in mean score discrepancies for the two types of questions because each was graded against time-specific criteria.

## Conclusions

The 45-minute period seemed to allow examinees to plan, organize, and execute a thoughtful essay that would be a useful addition to the application process. Concerns about the quality of writing in the 30-minute essays were too marked to promote the use of the 30-minute period for administration of an essay. Future research will focus on methods for increasing the reliability of the 45-minute topics.

The spring 1987 MCAT contained several additional questions about the examinee's native and/or second language. This information will be used to investigate more thoroughly the differences in essay performance for special groups of examinees.

Future work will also focus on answering questions presented in phases 2 through 4 of the evaluation plan. Validity data are being collected for a small number of students currently enrolled in medical school who have agreed to write essays. The relationship between their essay scores and medical school performance will be examined, and results should be available in 1988. The impact of the essay on the selection process will be investigated by schools participating in simulated admissions decision-making exercises and retrospective selection exercises. Several schools have already completed these exercises, and the results will be reported. Essays will be used by pilot schools in a variety of ways for selection of the 1988 entering class. These schools will use essays at differing points in their admissions process. Some will use them as an initial screening device, while others will consider them later in the admissions process, such as in conjunction with the interview.

Research on the impact of the essay on undergraduate students' course selection, such as the addition of writing courses, and on the types of medical school applicants, such as an increase in the number of applicants with nonscience majors, has been designed. Cost data on the development, administration, and distribution of the essay are being compiled.

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# Types of Medical Writing and Teaching of Writing In U.S. Medical Schools

*Karin L. Yanoff and Fredric D. Burg, M.D.*

**Abstract**—U.S. medical schools were surveyed to determine which types of medical writing are most important for physicians, house officers, and medical students to learn and whether such types are formally taught. According to the responding schools, the five most important types were: write-up of the patient history and physical examination, progress note and discharge summary (tied), peer-reviewed published paper (of either clinical or laboratory research), and grant proposal. Certain types, however, were considered more important for some categories of physicians and trainees than others. Although these major types of writing represent complex and diverse writing tasks, they are not taught extensively in medical schools or thoroughly explained in the literature on medical writing.

The quality of medical writing has been a longtime concern (1–4), and the negative consequences of ineffective writing by physicians have also been documented, for instance, failure to publish research, loss of grant proposals, increased litigation, and reduced patient compliance (5). Little research, however, has focused on the kinds of writing physicians actually do and need to learn to do well.

In a 1982 survey of U.S. medical school deans, Bjork and Oye (5) found that 15 of the 101 schools responding offered formal writing courses as electives and recommended that writing instruction be made part of the medical school curriculum. However, these authors did not determine what types of writing were, or should be, taught. Preliminary to designing a writing program for the University of Pennsylvania School of Medicine, the authors of the present report attempted to discover which kinds of writing are most important for physicians to learn and whether these types are taught.

## Methods

For the purposes of the survey reported here, medical writing was defined as those texts written, or sometimes dictated and edited, for a variety of purposes and audiences by medical students and house officers and by physicians in practice.

To determine the specific types of medical writing and the emphasis given to each, the authors examined two types of literature: first, 33 general texts on medical writing published between 1900 and 1985 and, second, books and articles written since 1966 on specific types of medi-

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cal writing. In this examination, the frequency of reference to a type of medical writing was assumed to indicate the relative importance of that type to physician-writers. The types of writing most frequently referred to in the general texts on medical writing were: scientific paper (that is, peer-reviewed published paper, of either clinical or laboratory research, other than the case report), case report, and abstract. Those types most frequently referred to in the books and articles on specific types of medical writing were: scientific paper, grant proposal, and write-up of history and physical examination.

These types of writing identified in the literature were discussed in interviews with eight individuals at different levels of medical training and in different settings, with four administrators concerned with medical education at the University of Pennsylvania School of Medicine, and with three editors of national medical journals. In considering the types of writing done in the practice of medicine, the authors categorized writers according to their level of medical training and the context in which their writing occurs: medical student, house officer, academic physician (full-time or part-time but working in an academic setting and involved in patient care, teaching, and/or research), and private practitioner (working in a nonacademic, clinical setting and not formally involved in teaching or research).

On the basis of the results of the literature survey and the interviews, a one-page questionnaire was designed. Because the term "medical records" includes types of writing relevant to different categories of physicians and trainees, depending on their level of experience, the term was broken down into particular types of inpatient records: write-up of history and physical examination, admitting note, progress note, discharge summary, operative report, and laboratory report. Some broader terms such as "teaching materials," "communications to patients," and "academic/administrative correspondence" were retained because a more specific breakdown would have made the questionnaire too long. Related types of writing were arranged together on the questionnaire.

In informal pilot testing of the questionnaire, copies were distributed to six individuals who had not been interviewed previously. Five of these were academic physicians with private practices and administrative experience and were from different departments; two of the five were departmental directors of medical education, and three were department chairmen. The sixth individual had a Ph.D. degree and was the director of an educational research center connected to a teaching hospital. After completing the questionnaire, the test group was asked whether the general format, directions, questions, and terms were clear; whether the categories of physicians and trainees and types of writing were valid; and whether all possible alternatives were given, items were ordered logically, and the questionnaire could be read easily and completed quickly. Final selection of the types of writing to be assessed resulted from this pilot testing of the questionnaire, and the term "other" was added to the types of writing to ensure that all types could be included.

On the revised questionnaire, respondents were asked, for each category of physician or trainee, to check the five types of writing most important for members of that category at any and all levels of experience within the category. "Importance" was defined on the questionnaire as referring to those types of writing that respondents felt were most needed to be taught if they were designing a writing program for their curriculum. In this definition, it was also pointed out that the importance might or might not coincide with the frequency of that type of writing. Respondents also were asked to indicate for each type of writing whether their institution offered any course or program that specifically taught how to do that type of writing. Finally, respondents were asked whether any other systematic writing instruction was available at their institution, and space was provided for brief comments.

Questionnaires were mailed in the fall of 1985. A follow-up letter and another copy of the questionnaire were mailed six weeks later.

The questionnaires were sent to the 125 U.S. medical schools that had full institutional membership in the Association of American Medical Colleges (AAMC) as listed in the Spring 1985 *Group on Medical Education Membership Directory* (6). The questionnaires were sent in care of one of the school's designated members of the Group on Medical Education (GME) of the AAMC. GME members are appointed to this group by their respective deans, and the particular members surveyed had a defined interest in undergraduate or graduate medical education or both. At the time of the survey, a majority of the 125 selected GME members were associate deans for academic affairs and were identified as the "GME correspondent," the liaison between the correspondent's respective institution and the GME.

## Results

Table 1 shows the 29 types of writing used on the questionnaire and the numbers of responding medical schools that offered formal instruction in these types of writing. The miscellaneous category "other" included creative and expressive writing and biographies for residency applications. These 29 types revealed a variety of contexts, purposes, audiences, uses, formats, media, and methods of transcription (longhand, shorthand, dictation, typing, word-processing). The audiences, for example, varied in size (one individual, small group, large group, mass audience), distance from the writer, level of education, and familiarity with the subject matter. A single type of writing such as a discharge summary might have multiple audiences and uses. Authorship itself might be single or multiple. Because their purposes differed, the types of writing also could exhibit different ways of thinking, organizational patterns, and stylistic features such as characteristic word choices and sentence structures.

A total of 100 (80 percent) of the 125 schools surveyed returned the questionnaire. Parts of all questionnaires were suitable for analysis; however, only 55 respondents complied with the direction that asked them to check only five types of writing for each of the four categories of physicians and trainees. Only these 55 questionnaires completed correctly were used to determine the major types of writing. Responses to each type of writing in each category of physicians and trainees were tallied. The five types of writing that received the highest number of responses in a particular category were considered to be the five most important kinds of writing for that category.

The five most important kinds of writing for the four categories are listed in Table 2. The highest responses regardless of category were considered to be the most important kinds of writing for all physicians and trainees. These were: write-ups of history and physical examinations, progress notes and discharge summaries (tied), peer-reviewed pub-

**TABLE 1**

**Numbers of 100 Responding U.S. Medical Schools Offering Formal Instruction in 29 Types of Medical Writing, 1985**

| Types | No. |
|---|---|
| Write-up of history and physical examination | 43 |
| Admitting note | 9 |
| Progress note | 18 |
| Discharge summary | 8 |
| Letter to referring doctor | 1 |
| Operative report | 1 |
| Laboratory report | 1 |
| Outpatient records | 5 |
| Consultation report | 3 |
| Student evaluation | 3 |
| Faculty member evaluation | 2 |
| Teaching materials (lecture notes, outlines) | 5 |
| Research protocol | 5 |
| Grant proposal | 12 |
| Case history (not for publication) | 1 |
| Case report (for publication) | 2 |
| Chapter in textbook | 0 |
| Textbook | 0 |
| Peer-reviewed published paper (other than case report) | 11 |
| Abstract | 4 |
| Descriptive note (of new instrument, procedure for publication) | 1 |
| Literature review | 5 |
| Essay | 3 |
| Editorial | 1 |
| Book review | 0 |
| Letter to editor | 1 |
| Communications to patients (letter reporting test, examination results; instruction sheet) | 2 |
| Academic/Administrative correspondence (cover letter, memoranda, job/institutional applications) | 2 |
| Other (specify) | 6 |

lished papers, and grant proposals (Table 2). Next most important were letters to referring doctor, outpatient records, consultation reports, admitting notes, student evaluations, and communications to patients, as shown in Table 3).

To determine the number of schools teaching particular types of writing, all the returned questionnaires were used. Table 1 shows, for each type of writing, how many of the 100 responding schools offered a course or program that specifically taught how to do that type. Forty-six schools did not offer formal instruction in any of the 29 types of writing listed on the questionnaire; at the other extreme, one school taught 14 of the 29 types.

The number of schools teaching the major types of writing for all physicians and trainees was examined. As shown in tables 1 and 3, 43 of the 100 responding schools offered a course or program that specifically taught physicians how to write up a history and physical examination; 18 taught how to write the progress note,

**TABLE 2**

**Numbers of 55 Responding U.S. Medical Schools Ranking the Types of Medical Writing Considered Most Important for Each of Five Categories of Trainees and Physicians, 1985***

| Category/Type | No. |
|---|---|
| Medical student | |
| Write-up of history and physical examination | 54 |
| Progress note | 47 |
| Admitting note | 27 |
| Outpatient records | 26 |
| Case history (not for publication) | 23 |
| House officer | |
| Discharge summary | 47 |
| Progress note | 36 |
| Write-up of history and physical examination | 34 |
| Admitting note | 32 |
| Outpatient records | 24 |
| Academic physician | |
| Peer-reviewed published paper | 41 |
| Grant proposal | 38 |
| Student evaluation | 31 |
| Consultation report | 25 |
| Teaching materials | 25 |
| Private practitioner | |
| Letter to referring doctor | 37 |
| Outpatient records | 35 |
| Consultation report | 33 |
| Discharge summary | 30 |
| Communications to patients | 30 |
| All | |
| Write-up of history and physical examination | 54 |
| Progress note | 47 |
| Discharge summary | 47 |
| Peer-reviewed published paper | 41 |
| Grant proposal | 38 |

* Respondents were asked to rank from among 29 types of medical writing the five considered most important to be taught if they were designing a writing program for their curriculum. Of the 100 who returned the questionnaire, 55 complied with the instruction to rank only five types of writing.

12 the grant proposal, 11 the peer-reviewed published paper, and 8 the discharge summary.

On the whole, the five types of writing considered most important for all physicians and trainees (listed in tables 2 and 3) correlated well with the types most frequently taught, except for the discharge summary, as shown in Table 3. Twenty-seven of the 100 responding schools taught only one of the five types of writing considered important for all physicians and trainees, while 12 schools taught three or four. Concerning the types most important for medical students, 22 schools taught only one, while eight schools taught three to five. Of the types most important for house officers, 21 schools taught only one type, and 10 taught three to five. In regard to the types most important for academic physicians, 11 schools taught one, while three taught three of the five types. And for those types most important for private practitioners,

**TABLE 3**

**Numbers of 55 Responding U.S. Medical Schools That Considered Each of 11 Types of Medical Writing Most Important To Teach and Numbers of 100 Responding Medical Schools That Offered Formal Instruction in the 11 Types of Medical Writing Most Frequently Taught, 1985**

| Considered Most Important To Teach | | | Taught by Greatest No. of Schools | | |
|---|---|---|---|---|---|
| Rank Order | Type of Writing | No. ($n = 55$) | Rank Order | Type of Writing | No. ($n = 100$) |
| 1. | Write-up of history and physical examination | 54 | 1. | Write-up of history and physical examination | 43 |
| 2. | Progress note | 47 | 2. | Progress note | 18 |
| 3. | Discharge summary | 47 | 3. | Grant proposal | 12 |
| 4. | Peer-reviewed published paper | 41 | 4. | Peer-reviewed published paper | 11 |
| 5. | Grant proposal | 38 | 5. | Admitting note | 9 |
| 6. | Letter to referring doctor | 37 | 6. | Discharge summary | 8 |
| 7. | Outpatient records | 35 | 7. | Other | 6 |
| 8. | Consultation report | 33 | 8. | Outpatient records | 5 |
| 9. | Admitting note | 32 | 9. | Teaching materials | 5 |
| 10. | Student evaluation | 31 | 10. | Literature review | 5 |
| 11. | Communications to patients | 30 | 11. | Research protocol | 5 |

eight schools taught only one type, while one taught three types.

Of the 100 responding schools, 48 taught none of the five major types of writing for all physicians and trainees, 56 taught none of the five major types for medical students, 57 taught none of the five major types for house officers, 79 taught none of the five major types for academic physicians, and 88 taught none of the five major types for private practitioners.

Only four of the 100 respondents indicated that their institution offered any systematic writing instruction other than formal teaching of specific types of texts. One of these four mentioned medical writing workshops for faculty members, while another noted writing seminars for students and fellows in biomedical research. Another indicated the availability of both a writing center that helped students improve their writing and a program that assigned writing fellows to individual medical faculty members who assigned papers in elective courses. No details regarding the writing center or type of writing fellow were given; however, the respondent explained that the fellows helped students prepare the assigned papers by critiquing their first drafts and then reviewing these drafts in individual conferences with the students, who later submitted the final draft, along with the critiqued draft, to the faculty member.

## Discussion

According to the literature search reported here, the various kinds of physicians' writing have never been comprehensively classified and analyzed Many types are taken for granted, although some, particularly the published kinds, are acknowledged as difficult for physician-writers. Even a brief analysis of the physician's possible writing tasks, however, reveals something of their diversity and complexity. Physicians and trainees with varying degrees of practice in both writing and medicine and under considerable time constraints compose texts in school, hospital, clinic, laboratory, and office settings. Using a variety of methods of transcription, they write for varied purposes and audiences, and their texts reveal different methods of reasoning, patterns of organization, and stylistic features.

A majority of the respondents showed interest in the survey by their response rate of 80 percent. Although a number of the respondents had difficulty limiting their choices to five types of writing per category of physician and trainee, the survey showed that they generally agreed on the types of writing that are the most important for physicians to learn. While certain types of writing could be considered important to physicians and trainees as a whole, the respondents indicated that the writer's role (medical student, house officer, and so forth) appeared to determine the relative importance of the types of writing.

The respondents saw certain types of medical writing as most important to include in a medical curriculum; and their responses indicated that when medical schools formally taught specific types of writing, these were generally the types taught. However, the survey also showed that, with the exception of the history and physical examination write-up, the total number of responding schools actually doing formal teaching of specific types of writing was relatively small. According to the survey, a majority of the medical schools did not formally teach the major types of medical writing or offer any other kind of systematic writing instruction.

In answering the questions concerning formal teaching of specific types of texts and other available systematic writing instruction, several respondents spontaneously commented on the availability of informal instruction within the medical curriculum. For example, they mentioned brief instruction by clerkship directors as students came on rotation or informal critiques of individual writings by faculty members and residents. Hypothetically, informal teaching would also include the various self-teaching strategies medical students and house officers engage in, such as imitating another physician's writing or following some sort of standardized model (7). A good deal of informal teaching thus may be present in medical schools; however, the questionnaire did not measure its frequency.

Even if school instruction, formal or informal, is available, it might not address important questions such as whether or not information is appropriately selected and effectively organized in the light of the purposes, audiences, and uses for the writing. For example, the nature of even the most fundamental type—the write-up of a patient's medical history and physical examination—varies as its purpose, audience, and use change from one kind of writer and context to another. The lengthy history and physical examination write-ups prepared by students for their teachers must show what the students have learned. Later in their training, the students must produce more concise write-ups that communicate precisely relevant information to multiple audiences outside of the school setting (7).

Skill in writing the first, lengthier kind of write-up may not ensure a student's success in the latter task because the ability to write effectively for one purpose and audience does not necessarily imply the ability to write effectively for another (8). As Sox and colleagues (4) noted, medical students "need help in making the transition from an excessively detailed written medical record and one that communicates succinctly what is needed to care for the patient." However, adequate instruction may not be available either in medical schools or in the literature that students or practicing professionals might refer to.

The literature on medical writing discusses the scientific paper, the grant proposal, and, to some extent, the history and physical examination portion of the medical record. Few articles or books treat other important types of writing, such as the admitting or progress note, letter to referring doctor, or discharge summary. Also, discussions in the literature tend to emphasize writing for publication and to offer editorial recipes for effective writing or advice on final published products rather than clear, detailed explanations of the processes involved in composing them and of key principles, such as their purposes, uses, and audiences.

The present authors consider that the lack of formal school and textbook instruction in the major types of medical writing points to an important but little explored area for future teaching. The present survey supports the need to develop curricula in medical schools that address the systematic and effective teaching of medical writing.

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## *Alan Gregg Memorial Lecture*

# The Rising Supply of Physicians And the Pursuit of Better Health

*Alvin R. Tarlov, M.D.*

Alan Gregg was born in Colorado Springs on July 11, 1890, son of a Congregational minister. After graduation from Harvard Medical School, a residency at the Massachusetts General Hospital, and two years in the Medical Corps in France, Dr. Gregg joined the Rockefeller Foundation in 1919, where he served for 37 years until his retirement in 1958. For his first decade with the foundation he served overseas, mostly studying the details of medical education in Europe. In 1931 he became director of the Division of Medical Education, later to become the Division of Medical Science, and in 1951 he became vice president. Among his accomplishments he is best known for introduction of psychiatry into medicine and for supporting the Kinsey report on sexual behavior. He died in 1957, one year after his retirement, at his home on the Pacific at Big Sur, California (1).

During his career he was more than captain of a large grant program to medical schools. He was friend, counselor, and protagonist of humanism to most of the influential physicians and medical educators of that era. His knowledge of ancient culture, history, and literature, his erudite literary style, his wisdom, and his gracious manner made him the most sought after figure in medical education. His writings are remarkably prescient concerning the preparation of students for the practice of medicine and the needs and wants of patients. In his 1940 Linsly R. Williams Lecture at the New York Academy of Medicine titled "Humanism and Science" (2), Dr. Gregg wrote, ". . . some patients would rather be understood than be x-rayed, and rightly so."

For Christmas 1969, my mentor, Hans Hecht, gave me a volume by Alan Gregg, *For Future Doctors* (3), inscribed: "A favorite book of mine/Alan was somewhat of a fatherly advisor to many of us." Each point in my presentation is a tribute to Alan Gregg, who understood the needs of the times ahead.

From 1940 to 1970 the number of physicians per 100,000 population remained level at 140. Late in this period, however, a perception arose that the nation was headed for a serious shortage of physicians. The population growth associated with the "baby boom" of 1946 to 1964, the rising confidence that advancements in biomedical science would make more medical services for all highly desirable, and the promise that Medicare and Medicaid would expand medical services to previously uncared for segments of the population all pointed toward an impending shortage. Four influential national reports—the Bane report to the surgeon general in 1959, the Coggeshall report to the Association of American Medical Colleges in 1964, the Miller report to the President of the United States in 1966,

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Dr. Tarlov is president of the Henry J. Kaiser Family Foundation, Menlo Park, California.

and the Clark Kerr report to the Carnegie Commission on Higher Education in 1970—all expressed a sense of national urgency; and all recommended rapid and vigorous action to increase the supply of physicians. Federal and state appropriations designed to implement the recommendations of these reports resulted. Funds were provided for facility construction and operating costs to increase the size and number of medical schools, and loans and scholarships were provided to attract more students to the expanded schools.

The results are shown in Figure 1 and Table 1. The three curves in Figure 1 illustrate the 23-year trend in number of medical schools, first-year enrollments, and graduates for the 127 allopathic medical schools and the 15 osteopathic schools combined. These curves were relatively flat in the decade prior to 1965. Since 1965 the number of medical schools rose 50 percent from 94 to 142 (attained in 1982), first-year enrollment doubled from around 9,000 to 19,000 (attained in 1983), and the number of graduates more than doubled from around 8,000 to almost 18,000 (attained in 1984).

The upswing in first-year enrollment from the foot of the rise to its crest was steep. During that 15-year period, percentage increases per year were 2.4, 6.5, 2.9, 6.8, 9.3, 8.0, 11.6, 3.1, 6.9, 2.6, 2.4, 3.5, 3.4, 2.7, 1.5 for an average increase of 5 percent per year. In contrast, the yearly percentage declines in first-year enrollment since 1983 have been minus 1.0, 0.4, 0.8, minus 0.6 percent. Therefore, throughout the next 15 years the number of medical school graduates will remain roughly double the number of 20 years ago; 16,000 in the year 2000, compared with 8,000 in 1965.

The cohort nature of these curves is essential for an understanding of manpower supply dynamics. From entry to medical school to cessation of practice is approximately 45 years. For the remain-

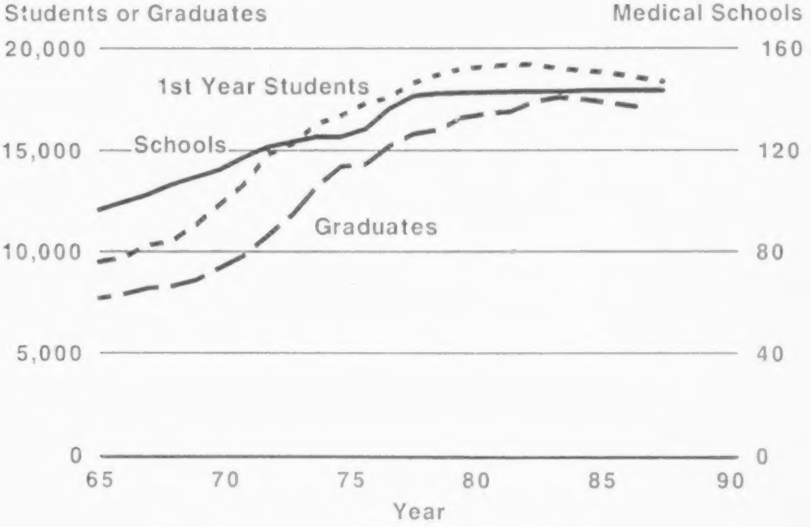

FIGURE 1

U.S. allopathic and osteopathic medical schools, first-year students and graduates, 1965–1987.

**TABLE 1**

**Enrollment of First-Year Students and Graduates of U.S. Medical Schools, 1965–1987**

| Academic Year | Allopathic Schools | | | | Osteopathic Schools | | | Combined | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. of Schools | Total First-Year Enrollment | New First-Year Enrollment | Graduates | No. of Schools | Total First-Year Enrollment | Graduates | Total No. Schools | Total First-Year Enrollment | Graduates |
| 1965 | 89 | 8,759 | 8,554 | 7,574 | 5 | 464 | 360 | 94 | 9,223 | 7,934 |
| 1966 | 92 | 8,964 | 8,775 | 7,743 | 5 | 480 | 405 | 97 | 9,444 | 8,148 |
| 1967 | 95 | 9,479 | 9,314 | 7,973 | 5 | 509 | 427 | 100 | 9,988 | 8,400 |
| 1968 | 99 | 9,757 | 9,740 | 8,059 | 5 | 521 | 427 | 104 | 10,278 | 8,486 |
| 1969 | 101 | 10,397 | 10,269 | 8,367 | 6 | 577 | 432 | 107 | 10,974 | 8,799 |
| 1970 | 103 | 11,367 | 11,169 | 8,974 | 7 | 623 | 473 | 110 | 11,990 | 9,447 |
| 1971 | 108 | 12,278 | 12,088 | 9,558 | 7 | 670 | 483 | 115 | 12,948 | 10,041 |
| 1972 | 112 | 13,642 | 13,570 | 10,396 | 7 | 810 | 649 | 119 | 14,452 | 11,045 |
| 1973 | 114 | [illegible]017 | 13,876 | 11,365 | 7 | 884 | 591 | 121 | 14,901 | 11,956 |
| 1974 | 114 | [illegible]78 | 14,579 | 12,716 | 9 | 957 | 698 | 123 | 15,935 | 13,414 |
| 1975 | 114 | [illegible]0 | 14,910 | 13,634 | 9 | 1,002 | 814 | 123 | 16,352 | 14,448 |
| 1976 | 116 | [illegible]7 | 15,282 | 13,614 | 10 | 1,066 | 892 | 126 | 16,735 | 14,506 |
| 1977 | 122 | [illegible] | 15,493 | 14,391 | 12 | 1,207 | 965 | 134 | 17,325 | 15,356 |
| 1978 | 125 | [illegible],613 | 16,054 | 14,966 | 14 | 1,297 | 1,003 | 139 | 17,910 | 15,969 |
| 1979 | 126 | 17,008 | 16,301 | 15,135 | 14 | 1,381 | 1,032 | 140 | 18,389 | 16,167 |
| 1980 | 126 | 17,205 | 16,590 | 15,673 | 14 | 1,467 | 1,129 | 140 | 18,672 | 16,802 |
| 1981 | 126 | 17,268 | 16,644 | 15,985 | 15 | 1,564 | 1,038 | 141 | 18,832 | 17,023 |
| 1982 | 127 | 17,254 | 16,567 | 15,802 | 15 | 1,618 | 1,315 | 142 | 18,872 | 17,117 |
| 1983 | 127 | 17,150 | 16,480 | 16,343 | 15 | 1,743 | 1,304 | 142 | 18,893 | 17,647 |
| 1984 | 127 | 16,997 | 16,395 | 16,318 | 15 | 1,714 | 1,484 | 142 | 18,711 | 17,804 |
| 1985 | 127 | 16,963 | 16,268 | 16,117 | 15 | 1,675 | 1,555 | 142 | 18,638 | 17,672 |
| 1986 | 127 | 16,819 | 16,103 | 15,830 | 15 | 1,665 | 1,579 | 142 | 18,484 | 17,409 |
| 1987 | 127 | 16,713 | 15,927 | | 15 | 1,653 | | 142 | 18,366 | |

Sources: Association of American Medical Colleges and American Osteopathic Association (first-year osteopathic school enrollment for 1965, 1970, and 1975 are author's estimates).

**TABLE 2**

**Projected Growth of Internists**

| Physicians | 1988 | 1998 | Percent Increase |
|---|---|---|---|
| Total internists | 103,680 | 140,870 | 36 |
| General internists | 59,490 | 74,340 | 25 |
| Subspecialty internists | 44,190 | 66,530 | 51 |
| Cardiologists | 12,610 | 17,950 | 42 |
| Gastroenterologists | 5,840 | 8,830 | 51 |
| Hematologist-oncologists | 6,130 | 9,550 | 56 |

Source: reference 4.

der of this century, new entry to practice from U.S. medical schools, now approximately 17,500, can be expected to be at the 17,000 to 16,000 level. However, attrition from practice, because of the 45-year cohort phenomenon, will be at the 1960s' rates, roughly 8,000, until around the year 2010. Therefore, with addition rates of 16,000 per year and attrition rates of 8,000 per year, there will be a substantial net gain of physicians in each of the next 25 years, continuing a trend begun in 1965 and lasting for 45 years.

Information for internal medicine, representing about 25 percent of all physicians, is typical of this remarkable growth (Table 2). By using standard demographic and actuarial methods for death, disability, and retirement, the number of internists expected for 1988 and for 10 years from now were calculated (4). There will be 140,000 actively practicing internists in 1998, an increase of 36 percent in just one decade. As shown in the last column, the growth rate of subspecialty internists will be twice that of general internists. Over the next 20 years, the band of difference between general and subspecialty internists will narrow progressively and reach parity by about the year 2008. For individual subspecialties in the next 10 years, there will be a 42 percent increase in the number of actively practicing cardiologists, a 51 percent increase in gastroenterologists, and a 56 percent increase in hematologists-oncologists. Adjusting for population growth, in this 10-year period alone the potential patient population for each individual physician will be reduced by 13 percent for the aggregate population of all physicians, minus 20 percent for internists and minus 33 percent for cardiologists.

The large increase in the number of actively practicing physicians during the 45-year period from 1965 to 2010 applies to almost all specialties as well as to internal medicine. For the United States, growth in the number of physicians has been and will continue to be approximately 2 percent a year every year. The growth rate of the general U.S. population during this same 45-year period will be less than 1 percent per year. At the start of this 45-year period in 1965, we had 140 physicians for 100,000 population. At the conclusion of growth in 2010, we will have 280 physicians for 100,000 population.

### Effects of Increased Physicians

One consequence of a doubling of the capacity of the medical schools and brisk increases in the number of practicing physicians that is observable today—20 years before full growth has been completed—relates to physician work load. Each year the Center for Health Policy Research of the American Medical Association publishes results from its Socioeconomic

Monitoring System. The data derive from a lengthy survey instrument completed by approximately 4,000 physicians each year. In the five years from 1982 to 1986, there was a 9 percent reduction in the total number of patients seen, with 6 percent fewer seen in the office and 20 percent fewer seen in the hospital (Table 3, reference 5). Median net income after expenses rose 22 percent over the five years, but in real or deflated dollars this represents only a slight increase (the consumer price index rose 17.6 percent in the same period). A range of possible explanations for the decreased patient work load can be offered, including restraints on utilization imposed by government regulations and health plan contracts and changing work habits preferred by physicians who favor more leisure time. Nevertheless, a continuing brisk increase in the supply of physicians can also be invoked as an explanation for a declining patient work load.

In addition to the measurable effects of a rising physician supply, there are other "enabling" consequences. The rapid growth of prepaid price competitive health plans, the health maintenance organizations, with 30 million current enrollees and growth rates exceeding 20 percent annually, and still rising robustly, would not have occurred without a plentiful supply of physicians. The emergence of preferred provider plans, out-of-hospital surgery, and other cost-cutting developments has been facilitated by the availability of a plentiful supply of physicians willing to depart from traditional practice characteristics. The pro-competition endeavors in the 1980s to contain costs of medical services would not have been so readily implemented without the rising supply of physicians.

Another potential consequence of the rising supply of physicians could be a further evolutionary change in the health care system to the possible detriment of physicians. The pro-competition movement in health can be perceived as being ineffective. Health care expenditures continue to rise at two to three times the rate of inflation; surplus capacity has not been substantially reduced; there is no evidence that quality is being enhanced; and upwards of 30 million people do not have health insurance. In the years ahead policies will be considered by some plans—Medicare first—to identify selected physicians whose record indicates a more conservative approach to utilization of tests, drugs, and hospitals. Prospective budgeting with caps and more fixed or limited physician income plans will be introduced. A system of universal health insurance will be reconsidered. The freedom to experiment with more bold innovations, most of which will further

**TABLE 3**

**Mean Number of Patients Seen by U.S. Physicians per Week and Median Net Annual Income of Physicians**

| Patients/Income | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|
| Patients | | | | | |
| Total seen | 129.1 | 123.4 | 118.1 | 117.1 | 117.7 |
| In office | 80.2 | 77.4 | 73.0 | 73.5 | 75.7 |
| In hospital | 32.3 | 32.9 | 28.4 | 27.2 | 25.8 |
| Discharged from hospital | | 5.5 | 5.0 | 4.8 | 4.7 |
| Length of stay (days) | | 6.0 | 5.7 | 5.2 | 5.3 |
| Income (in thousands of dollars) | 82.0 | 88.0 | 92.0 | 94.0 | 100.0 |

Source: reference 5.

limit the individuality of physicians, could not occur, in my view, without a supply of physicians greater than was present 20 years ago.

Another possible consequence of the rising physician supply could be a further lessening of the interest of college age students in medicine as a career. This will be discussed later.

## Medicine's Conceptual Basis

The concept of medicine as a formally recognized biological science will soon be 100 years old. In the late 1880s sufficient knowledge regarding the biology of disease had accumulated to allow medicine to be considered a science and a bona fide intellectual discipline. The visionaries of that time advocated that medicine should join its sister sciences within the universities. When confronted with the issue as to where within the university structure medicine should reside, decisions were made to place it in that sector of the university devoted to the natural sciences. Disease was thought to be an aberrancy of the work of nature. Medicine became separated from fields devoted to the works of man, the humanities and the social and behavioral sciences. It is not surprising, therefore, that 100 years later the concepts that underlie medicine derive largely from the natural sciences. The state of health is measured using biochemical and physiological parameters. Medical interventions are almost entirely biologic intrusions. Concepts derived from study of the works of man, how our social systems are organized and how they influence health, and the limitless variety of human reactivities to social circumstances have not penetrated the exclusive domain of the works of nature. Charles Odegaard has written on this topic (6).

The centennial of the formal acceptance of medicine as a biological science should provoke a fresh examination of medicine's conceptual basis. Three concepts seem especially important for discussion: (*a*) What is health? (*b*) What are the determinants of health? (*c*) What interventions in health are most appropriate for tomorrow's physicians?

### PARADOX IN HEALTH

Health and ill health do not bear a dichotomous relation to each other. Rather, a continuous spectrum extends between good health and poor health. Currently available information on health status allows individuals, communities, or whole populations to be plotted at their respective positions along the spectrum. Some important indicators of health include infant and maternal mortality, life expectancy, morbidity and mortality rates from specific causes, body weight, serum lipid concentration, blood pressure, and disability figures. An entity's position along the spectrum can change with time by, for example, advances in sanitation and nutrition, economic circumstances and education, health care, or social norms and policies.

During the 100 years of medicine as a biologic science, great strides have been made toward improved health. The statistics for life expectancy from birth speak clearly: 49 years in 1900 and 75 years today. Yet, as Leonard Sagan points out in his new book, *The Health of Nations* (7), improvements in U.S. life expectancy in the past three centuries cannot be attributed to advancements in medical care, nutrition, or sanitation. Social factors, including level of education and economic circumstances, are the strongest correlates with life expectancy.

The great paradox in health in the United States is that the nation ranks first in the world in per capita health care expenditures (8) and first in the application of advanced technology but 10th to 20th in most statistics describing health status (for example, 10th in maternal mortality [9], 17th in infant mortality, and 19th in life expectancy). In 1986 the U.S. spent $458 billion on health care, $1,837 per person (10). Yet, most industrialized nations that spend considerably less have lower infant mortality and greater life expectancy. In the United States,

1. We join a few other western industrialized countries in leading the world in the prevalence of major chronic diseases, including heart disease, cancer, and stroke.
2. Each year some 1.5 million Americans suffer a heart attack; heart disease causes an estimated 770,000 deaths each year, or 38 percent of all deaths (11).
3. 300,000 Americans die each year from causes directly attributable to cigarette smoking.
4. The levels of illicit drug use by youths is greater than can be found in any other industrialized nation in the world (12).
5. We lead in having 80 percent of the worldwide cases of AIDS.
6. We have the highest rate of adolescent pregnancy, abortion, and childbearing among all western developed countries (13).

Surely the paradox of high health care expenditures and less than optimal health status cannot be attributed either to failures in health care delivery, as egregious as some of the defects are, or to failures of immunization and sanitation. Rather, dramatic shifts in disease patterns in the last 100 years suggest other factors. In 1900 the five leading causes of death in the United States were pneumonia and influenza, tuberculosis, acute intestinal infections, heart disease, and stroke. By 1985 the order became heart disease, cancer, stroke, accidents, and chronic lung disease. The shift from an earlier preponderance of infectious disease to the current prevalence of chronic disease, the rise in mortality from cardiovascular disease in the first half of the 20th century and the decrease in the past 20 years, the increasing prevalence of some types of cancers and the decrease in others, and immigrants' single-generation adoption of the disease patterns of their new home countries all suggest that influences external to the individual are major determinants of health and disease.

## DETERMINANTS OF HEALTH

Using the total economic costs of all illness as measured by Rice and colleagues (14, 15) and the proportion of all illness attributable to antecedent negative health behaviors (16), we have calculated the proportion of the economic costs of illness ascribable to their behavioral antecedents (Figure 2 ). The antecedents, take note, are principally social rather than genetic or biologic. As Figure 2 demonstrates, the combination of tobacco use, alcohol misuse, motor vehicle crashes, other injuries, and substance abuse account for 52 percent of the total economic costs of illness. Dietary factors, lack of physical fitness, and unattended hypertension account for a high proportion of the remaining 48 percent. A recently published project by the Centers for Disease Control and the Carter Center of Emory University (16) indicates that two-thirds of all disease and premature death is due to behavioral and societal characteristics and, therefore, is theoretically avoidable. These avoidable factors undoubtedly are major contributors to the station assumed by individuals, communities, and whole populations along the spectrum of health. Negative health behaviors do not arise by chance. They reflect the social circumstances immediately surrounding a per-

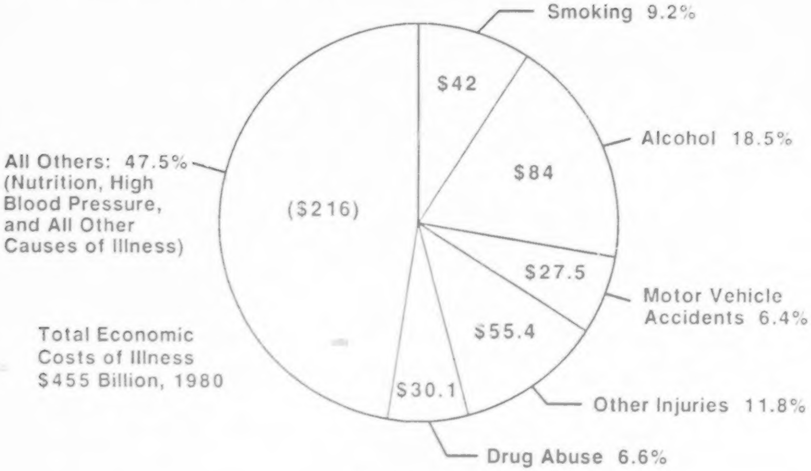

FIGURE 2
Behavioral antecedents and costs of illness (in billions of dollars), United States, 1980. (Sources: references 14 and 15)

son's life. Important surrounding circumstances include: cultural beliefs; family customs; fads; fashions; social norms; commercial practices including advertising and marketing strategies; the content of television, radio and newspapers; political and economic features; local ordinances and laws; and regulations. The fundamental characteristics of a society determine the behaviors of its members, and these behaviors are the major determinants of health.

Socioeconomic status, including educational attainment, income, and occupation, has been demonstrated to be a powerful determinant of health. Marmot (17) studied the age-adjusted mortality rates of 17,000 civil service employees in the United Kingdom for 10 years. The civil servants were analyzed by job classification, the highest being the senior executives and the lowest being manual laborers. An inverse relationship between job class and death rate was demonstrated (Figure 3). The lower the job class, the higher the death rate. The vertical scale in the figure is logarithmic and may conceal the magnitude of the differences. The manual workers had death rates two times greater than the next grade, three times greater than the third grade, and four times greater than the senior executives. The results defined a continuous inverse relationship over the entire spread of socioeconomic indicators and even held in a single job class when the members were subclassified according to educational level.

Similar relationships have been found in every society in which they have been studied. For populations as a whole, persons with higher socioeconomic status on the average exhibit better health status. A specific level of health cannot be explained fully by nutrition, clothing, housing, and access to medical care. Factors associated with education, occupational level, and income might account for as much as half of the socioeconomic-health relationship. Education seems to play an important role by conditioning tastes and preferences, affecting compliance with

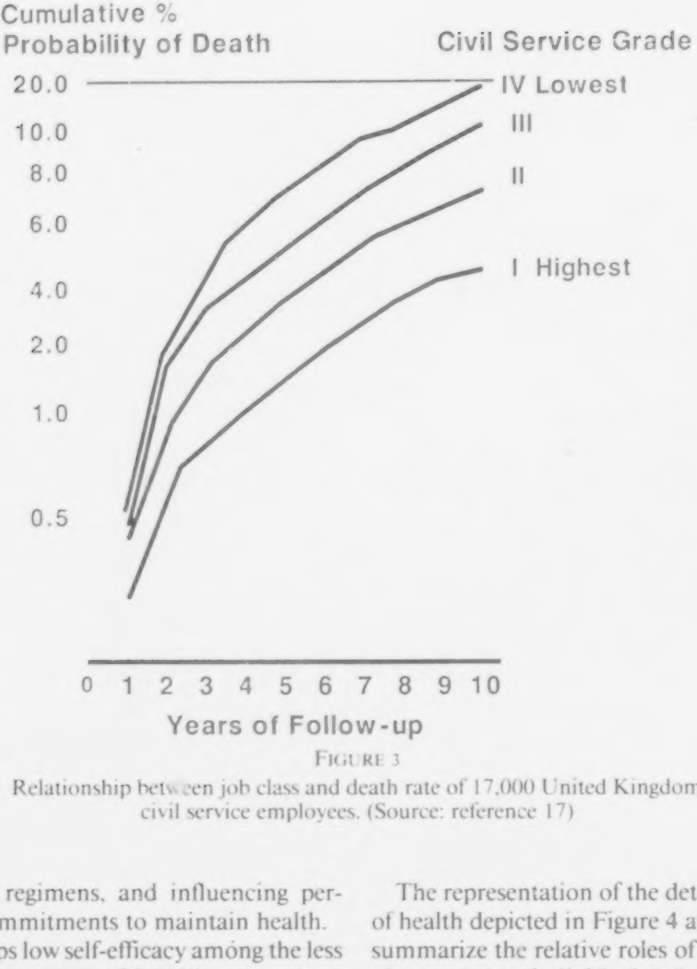

FIGURE 3

Relationship between job class and death rate of 17,000 United Kingdom civil service employees. (Source: reference 17)

medical regimens, and influencing personal commitments to maintain health.

Perhaps low self-efficacy among the less well off—a sense of inability to make a difference in the circumstances of one's life—lowers resistance to disease. Much more research needs to be done. Nevertheless, lower socioeconomic status does lead to poorer health and less favorable responses to therapy. Interventions focused on improving health must take into account the concept that surrounding social circumstances in themselves lead to disease and death quite independently of the effects of genes, unhealthy behaviors, and the availability of health care.

The representation of the determinants of health depicted in Figure 4 attempts to summarize the relative roles of biological phenomenon, individual behavior, and social circumstances. The determinants are the precursors of the biological processes by which disease is manifest. The determinants are overlapping and interactive. Certainly some aspects of individual behavior result directly from powerful social influences. For example, diet, tobacco use, drug abuse, and adolescent sexual activity are influenced by social norms, including television content and advertising. These social norms, tobacco smoking, for example, ultimately are sus-

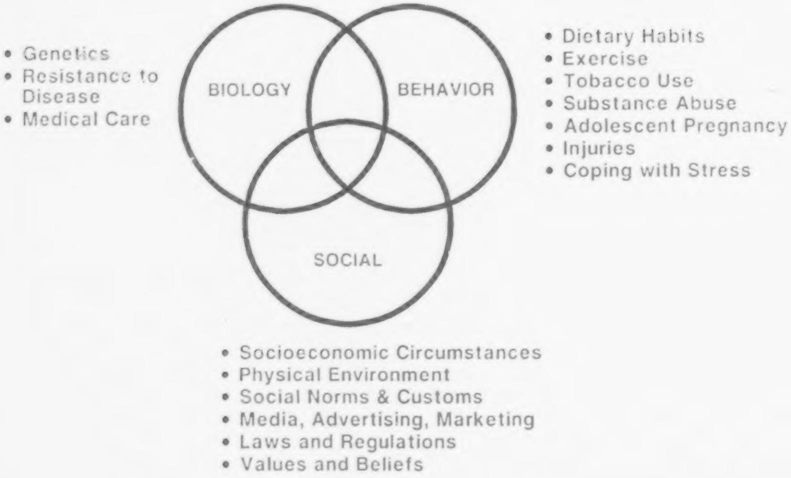
• Genetics
• Resistance to Disease
• Medical Care
BIOLOGY
BEHAVIOR
• Dietary Habits
• Exercise
• Tobacco Use
• Substance Abuse
• Adolescent Pregnancy
• Injuries
• Coping with Stress
SOCIAL
• Socioeconomic Circumstances
• Physical Environment
• Social Norms & Customs
• Media, Advertising, Marketing
• Laws and Regulations
• Values and Beliefs

FIGURE 4

Relative roles of biological phenomena, individual behaviors, and social circumstances as determinants of health.

tained by becoming encoded in laws and regulations, such as subsidization of tobacco farming and low excise taxation of tobacco products. Similarly, the social influences affect powerfully the effectiveness and accessibility to medical care, as exemplified by the fact that 30 million Americans are without health insurance, and health care has a weaker effect on the health of lower socioeconomic groups than on the middle class. Considering these factors and making gross estimations, we think that each of these three broad categories of determinants accounts for approximately one-third of the influences determining an individual's or a population's station along the spectrum of health.

Clearly, advances in medical care, both diagnosis and treatment, are astonishing. I do not wish to imply that biology's ascendancy in medicine has reached a zenith. In the decades ahead, biomedicine will continue to introduce new treatments that promise to rescue large numbers of people from the suffering of disease. As a primary determinant of health, however, medical care plays only a modest role.

### INTERVENTIONS

Perhaps the U.S. paradox in health—larger expenditures for health care but less favorable health status compared with many other nations—can be explained in part by the large resources devoted to medical care, which plays a relatively subsidiary and after-the-fact role as a determinant of health, while too little attention is given to the more fundamental underlying characteristics of U.S. society and individual behavior, some of which are powerful contraindicators of good health.

As illustrated in Figure 5, ill health can be viewed as being at the apex of a pyramid of antecedent underlying factors. Cardiovascular disease will be used as an example. It accounts for about a million deaths per year and half of the total economic costs of illness. Employing the conceptual framework that has grown out of

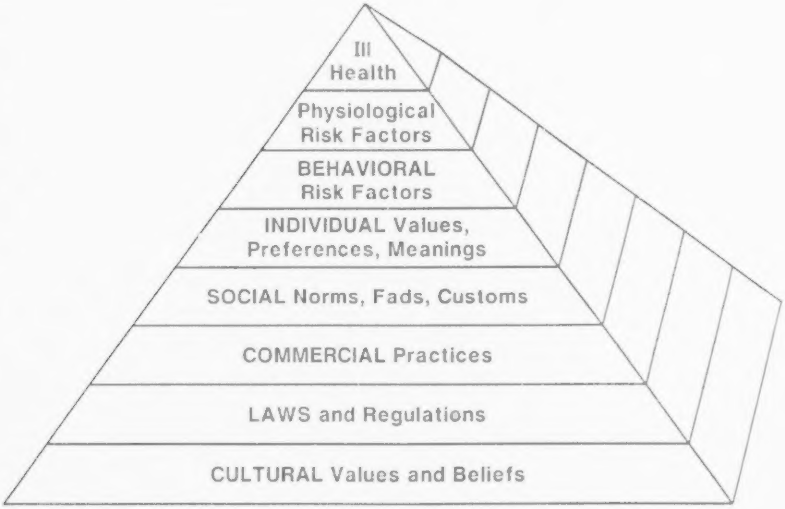
Ill Health
Physiological Risk Factors
BEHAVIORAL Risk Factors
INDIVIDUAL Values, Preferences, Meanings
SOCIAL Norms, Fads, Customs
COMMERCIAL Practices
LAWS and Regulations
CULTURAL Values and Beliefs

FIGURE 5
Antecedent underlying factors of ill health.

biology, we have focused on genetic causes or new techniques to crush an atherosclerotic plaque or transplantation. Genetic factors clearly play a role. But genetic factors related to congenital hypercholesterolemia account for only a minor portion of cardiovascular disease. Multiple genetic factors acting in concert may provide a predilective tendency to cardiovascular disease, but the predilection needs to be triggered by external factors and can be overwhelmed by them. The physiological risk factors that precede and lead to cardiovascular disease include hypercholesterolemia and several others. But the physiological risk factor (in this example, hypercholesterolemia) stems directly from antecedent behavioral risk factors, including a diet in which 40 percent of the calories are derived from fat.

Each individual has a system of personal values, preferences, and meanings that not only condition his behaviors but also determine his reactions to ill health and to medical care. Individual values and behaviors are not selected by individuals or populations at random but are reflections of social norms, fads, and customs, such as the U.S. preference for animal fats and dairy foods. The social norms are reinforced by commercial practices, such as the production, distribution, advertising, and marketing of beef and dairy products that are high in fat and cholesterol. These commercial practices frequently become enduring by becoming fixed in laws and regulations. For example, agricultural subsidies provide powerful incentives for the production, distribution, and marketing of high fat milk and its products, and these same subsidies penalize economically the production and marketing of low-fat milk products. Similarly, the U.S. Department of Agriculture's regulations on labeling of meats and processed foods encourage and sustain high fat diets.

Underlying and supporting the pyramid of causation are cultural values and beliefs. Americans place a high value on a free economy with minimal regulation. We place the highest value on individual freedom and free choice. The freedom to promote, offer for sale, and to purchase deathly products such as animal fat, cigarettes, and firearms is fastidiously protected by the same populace that is celebrant with these freedoms in the bicentennial year of our constitution. Further on values and beliefs, individuals, business, governments, and professional societies lack the will to think and behave with the long-term health of individuals as a principal concern, and Americans have an unrealistic dependency on health care and especially on the newer high technology interventions to assure individual well-being.

Lung disease, diabetes, a large fraction of cancers, and gastrointestinal disease could be used just as effectively to illustrate the working of the pyramid of causality.

By far the overwhelming concern of the physician has been at the top of this pyramid, that is, the diagnosis and treatment of ill health. The physiological risk factors, which are the direct physical and chemical accompaniments of ill health, are attended to by the physician, but physicians pay scant and ineffective attention to behavioral risk factors and their roots in antecedent circumstances. The biopsychosocial concept of medicine introduced by Dr. George Engel of the University of Rochester School of Medicine and Dentistry attempts to broaden the medical paradigm by including the humanistic dimensions of each individual—and that is important—but that concept also remains too narrow for a revised medicine. Most practicing physicians, medical educators, and medical societies leave topics below the level of physiology to nurses, allied health professionals, or to chance or to research by public health specialists and social scientists. Medical education remains embedded in a narrow view made restrictive by an exclusive biologic perspective. Perhaps our predominant focus on diagnosis and treatment through the narrow-angle lens of biology was appropriate for the past century of medicine. Certainly into the future, patients will need physicians for their traditional roles, and in that physicians are irreplaceable. Biology will continue as a necessary footing for medicine, but biology is much too narrow a base upon which to build an effective approach to health and to medical care when health fails.

## Revised Conceptual Framework

Advancements in science, both in the natural and in the social sciences, permit beneficial interventions to be made in fundamental ways before disease and premature death become inevitable. Deeper into the pyramid, interventions may be more effective. At another time and in another era, concentration at the top was appropriate. Now, with awareness of the paradox in health and with new knowledge on the determinants of health, the vista of concern of physicians and their professional organizations should be broadened. The place to start is in medical education.

Medicine needs a revised conceptual framework. Biologic concepts need to be joined with concepts stemming from social, economic, governmental, and cultural phenomena. Health should be understood in sociocultural and behavioral as well as biological terms. New roles for physicians and new interventions of great potential benefit to patients await our enthusiastic embrace. The objectives of a physician in the care of a patient and as a professional in society need to be cast in a new configuration. Until this is accomplished, attempts to improve medical education will be of limited benefit to the health of patients.

A limited biotechnical view of medicine is unattractive to young students in college thinking of their futures. They have been immersed in broad social and humanistic studies. They are interested in the worth of societal practices. They seek a future in which they can play a role in improving life's quality, both for individuals and for society generally. But, increasingly these young educated idealists perceive that medicine is an opportunity to become a disease technician. They have a disquieting concern that life as a physician taken as a whole may be lacking in significance. Although other factors interplay, the narrow focus of medical education gnaws at the root of the declining numbers of applicants to medical school, 28,123 for the class that entered in September 1987, down from 31,323 the previous year—and still falling.

The two parallel developments—the impending restructuring of medical practice and the need to restructure the conceptual framework of medicine—converge to create a windfall of opportunity. The rising supply of physicians, the U.S. paradox in health, a more profound understanding of the determinants of disease, and the necessity to make medicine more attractive to prepared youth beg for a reformulated conceptual framework for medicine. The timing is right. The needs of both medical education and medical practice offer opportunities for fundamental restructuring.

It should not escape our notice that the declining interest of college students had a parallel in a declining interest of medical school faculty members in becoming a medical school dean. It has been the worst of times for deans. However, the imperative to formulate a new conceptual basis for medicine offers the once-in-a-century opportunity for an ambitious remodeling of the substance of medical education, the characteristics of the faculty of medicine, and the intersection of the medical school with other components of the university and with the sociocultural environment in which patients live and disease develops. These could become the best of times for deans. That is one meaning of the rising supply of physicians.

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# The Quality of Care Received by Older Patients In 15 University-Based Ambulatory Practices

*Albert L. Siu, M.D., Barbara Leake, Ph.D.,*
*and Robert H. Brook, M.D., Sc.D.*

**Abstract**—To evaluate how the medical problems of older patients are managed in university-based internal medicine practices, the authors reviewed the medical records of 1,527 outpatients treated at 15 university teaching hospitals. Specific treatments for hypertension or diabetes had similar frequencies in patients 65 years of age and over and in patients under age 65. However, although the medical records mentioned hypertension in 43 percent and diabetes in 12 percent of the patients 65 or over, dementia and incontinence were recorded in only 0.4 percent and 2 percent, respectively. This finding suggests either that these elderly patients were extremely atypical or that their geriatric problems were unrecognized.

In the last decade, leaders of the medical profession have acknowledged a need to increase medical education in gerontology and geriatrics. Their concern springs from several factors. Older persons already account for a third of the office visits made to internists (1), and they are presently the most rapidly growing segment of the population. The care of older patients presents distinct clinical questions. The focus of the history and physical examination is different for older patients with functional limitations than for other patients. Also, common medical problems frequently have atypical manifestations in older patients (2), and a number of conditions—such as dementia and incontinence— are much more common in this population than in others.

There is a concern that health professionals are biased against or inattentive to the medical problems of older persons (3). Since future physicians receive much of their clinical training in the ambulatory setting of residency programs, the present authors evaluate the attention paid by medical residents and their faculty supervisors to the clinical problems of older patients seen in 15 teaching hospitals across the country. The goal of the evaluation was to answer two questions: How did the quality of care received by patients over age 65 compare with that received by younger patients? How frequently did the residents and faculty physicians evaluate clinical problems specific to the elderly population?

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An abstract of this paper was presented at the 1986 national meeting of the Society for Research and Education in Primary Care Internal Medicine, Washington, D.C. The research reported here was supported by grants from the Robert Wood Johnson Foundation and the Henry J. Kaiser Family Foundation.

Dr. Siu is assistant professor of medicine, Dr. Leake is senior statistician, and Dr. Brook is professor of medicine and public health, all in the Department of Medicine, University of California, Los Angeles, UCLA School of Medicine.

## Methods

In this study the authors analyzed data collected as part of the evaluation of the Robert Wood Johnson Foundation's Teaching Hospital General Medicine Group Practice Program (4). In 1980 the foundation funded the development of general medicine group practices to replace the general medicine clinics at 15 teaching hospitals across the country. The 15 hospitals were: Albany Medical Center Hospital, New York; Georgetown University Hospital, Washington, D.C.; Johns Hopkins Hospital, Baltimore, Maryland; Medical College of Virginia Hospitals, Richmond; Mount Sinai Hospital, New York, New York; New England Medical Center Hospital, Boston, Massachusetts; North Carolina Memorial Hospital, Chapel Hill; Saint Louis University Hospital, Missouri; UCLA Medical Center, Los Angeles, California; Medical Center at the University of California, San Francisco; University of Colorado Health Sciences Center, Denver; Middlesex General Hospital, New Brunswick, New Jersey; Vanderbilt University Medical Center, Nashville, Tennessee; West Virginia University School of Medicine, Morgantown, West Virginia; and Yale-New Haven Hospital, Connecticut. The primary provider in these group practices was a resident in 44 percent of the cases, a faculty physician in 40 percent of the cases, and a nurse practitioner 16 percent of the time (4).

In 1981 an age-independent random sample of approximately 100 continuing patients was selected from each practice's log of daily visits. The medical records were reviewed for the care received by these patients starting with their first visit to the practices until the time of the record review. Each patient chosen had been in the practice for at least six months; thus, the duration of care reviewed exceeded six months for all patients and exceeded one year for 63 percent of the patients. Complete medical record data were obtained in 98 percent of the cases.

Clinical information on each patient was abstracted from the medical record by medical record technicians. These data were used to compile lists of all diagnoses and conditions (up to 20 diagnoses per patient) that were treated or considered during the period reviewed. Specific treatment criteria were then applied to assess the quality of care received by patients with diabetes or hypertension. These criteria encompassed the history, physical examination, laboratory tests, and treatments rendered and the follow-up conducted for these conditions.

Chi-square analyses and *t*-tests were used to compare the services and treatments received by patients 65 years of age and over with those received by patients under age 65. To assess the effect of age on selected quality-of-care criteria while controlling for possible confounding variables (for example, Medicaid status and smoking history), the authors performed multiple linear and logistic regression analyses; these analyses used age as an independent variable and the quality-of-care measure as the dependent variable. Since these adjustments had no significant impact on the effects of age, the results of bivariate analyses are reported.

## Results

Thirty-two percent of the 1,527 study patients were age 65 or over. Nationwide, 34 percent of internists' patients are over 65 years of age (1). Eleven percent of the study patients were 75 or over; 69 percent were women (versus 59 percent nationally for internists), and 45 percent were black (versus 9 percent nationally).

Many of the 490 patients 65 or over had limited physical function: 38 percent reported difficulty walking one block or climbing one flight of stairs, 12 percent needed help in walking, and 5 percent needed help bathing, dressing, toileting, or eating. By comparison, the national percentage of noninstitutionalized individuals over 65 who need help walking is 5.7 percent (5).

Assessment of general services and laboratory examinations revealed no large differences in the receipt of these services by older and younger patients, as shown in Table 1. The few statistically significant differences tended to favor more thorough evaluation of the older patients; however, this tendency may reflect differences in the prevalence of chronic conditions and indications for screening in the two populations.

Laboratory testing and follow-up were either similar for the two categories of patients or marginally more thorough for older patients than younger patients with hypertension; however, the degree of blood pressure control obtained, based on the three most recent recordings, was somewhat better among younger patients (Table 2). Thirty-one percent of the younger patients versus 17 percent of the elderly patients had a blood pressure less than 140/90 mm Hg ($p < .001$). These percentages were almost equal (47.8 percent and 45.5 percent) for the two groups when control was defined less stringently as a blood pressure less than 150/95 mm Hg for those under 65 and less than 160/95 mm Hg for those 65 or over. The pattern of the hypertension results was similar when those under 65 were compared with those over 75.

Nutrition counseling was more likely to be received by the younger diabetic patients (70 percent for younger versus 54 percent for older patients; $p < .05$);

**TABLE 1**

**Percentages of Patients, by Age Group, Whose Medical Records Contained Specific Baseline Data or Test Results in Internal Medicine Group Practices at 15 Teaching Hospitals, 1981[*]**

| Data/Tests | Under 65 Years ($n = 1{,}037$) | 65 Years and Over ($n = 490$) |
|---|---|---|
| Baseline Data | | |
| List of current medications present | 93.8 | 97.8[§] |
| Blood pressure recorded during abstraction period | 98.8 | 99.4 |
| Tests | | |
| Hemoglobin/hematocrit (men)[†] | 66.3 | 71.5 |
| Hemoglobin/hematocrit (women)[‡] | 75.1 | 72.8 |
| Random glucose | 72.0 | 78.3[**] |
| Fasting glucose | 14.9 | 10.1[**] |
| Blood urea nitrogen | 70.8 | 79.1[††] |
| Creatinine | 64.4 | 70.4[**] |
| Urinalysis | 49.2 | 46.2 |
| Thyroid functions | 24.8 | 24.1 |
| Stool hemoccult | 42.3 | 48.3[**] |

[*] For names of hospitals and method of review, see text.

[†] For 312 men under 65 and 151 men 65 and over.

[‡] For 723 women under 65 and 335 65 and over.

[§] Difference between age groups significant at $p < .01$.

[**] Difference between age groups significant at $p < .05$.

[††] Difference between age groups significant at $p < .001$.

TABLE 2

**Percentage of Hypertensive Patients, by Age Groups, Receiving Specific Treatments in Internal Medicine Group Practices at 15 Teaching Hospitals, 1981**

| Treatments | Under 65 Years ($n = 492$) | 65 Years and Over ($n = 308$) |
|---|---|---|
| Blood pressure measured each visit during abstraction period | 63.3 | 70.4 |
| Blood urea nitrogen/creatinine obtained within one year before or within eight weeks of first visit | 79.5 | 86.0* |
| Blood urea nitrogen/creatinine obtained at least once during abstraction period | 85.4 | 86.7 |
| Follow-up within eight weeks if blood pressure not controlled, or follow-up within four months if controlled on two or more drugs, or within six months otherwise | 67.2 | 76.5† |
| Medication regimen changed if blood pressure not controlled‡ | 67.8 | 63.2 |

* Difference between age groups significant at $p < .05$.

† Difference between age groups significant at $p < .01$.

‡ For 87 patients under 65 and 76 patients 65 and over.

otherwise, the process of care was similar for diabetics in both groups (Table 3).

Chronic medical problems were common in the study patients 65 or over. Among the patients over 65, the prevalence of hypertension (42.9 percent) and diabetes (11.9 percent) was slightly higher than the comparable nationwide prevalences of 39.0 percent for hypertension and 8.9 percent for diabetes (6). On the other hand, the prevalence of arthritis (including inflammatory and degenerative disorders) was lower in the group practice (25.6 percent) than nationwide (49.6 percent).

Clinical problems that involved diagnostic and therapeutic issues limited to the elderly were not recorded frequently. Depression was reported in only 6.9 percent of the study patients 65 or over, and dementia was mentioned only twice (0.4 percent). By comparison, symptoms of depression have been reported to occur in an estimated 15 percent of older noninstitutionalized persons (that is, those in the community), and 3.7 percent experience major depression (7). Moreover, 1.3 to 6 percent of older persons in the community have been reported to have severe dementia and up to 15 percent to have mild cognitive impairment (8).

In the present study, osteoporosis was reported in 1.2 percent of the women 65 or over ($n = 336$) and in 1.6 percent of the nonblack women over 65. Estimates of the overall prevalence of osteoporosis among elderly women vary (9), but approximately 12 percent of older women have been reported to have radiologic evidence of compression fractures (10).

**TABLE 3**

**Percentages of Diabetic Patients, by Age Groups, Receiving Specific Treatments in Internal Medicine Group Practices at 15 Teaching Hospitals, 1981**

| Treatments | Under 65 Years ($n = 148$) | 65 Years and Over ($n = 71$) |
|---|---|---|
| Fundoscopic examination performed annually | 55.9 | 55.7 |
| Nutrition counseling received during abstraction period | 70.3 | 53.5† |
| Special diet ordered during abstraction period | 76.5 | 63.4 |
| Urine or blood testing performed at home for patients on insulin* | 90.1 | 96.7 |
| At least one blood sugar ordered every six months if patient was on insulin* | 44.0 | 43.3 |
| Blood urea nitrogen or creatinine ordered at least annually | 86.2 | 92.3 |
| Urinalysis ordered at least annually | 64.5 | 64.6 |

* For 91 patients under 65 and 30 patients 65 and over.
† Difference between age groups significant at $p < .05$.

Finally, in the present study incontinence was reported in 2 percent of the patients 65 or over, compared with an estimated 6.9 to 17 percent reported among community elderly (11, 12).

Because the authors sampled patients from the practice visit logs, the estimated prevalences for individual conditions could have been biased if patients with that condition visited the practice more or less often than the average patient, who made 6.8 visits per year. Thus, the estimated prevalences of hypertension and diabetes were adjusted for the more frequent visits made by patients with diabetes (8.0 visits per year) and hypertension (6.9 visits per year). Adjustments were made by multiplying the original estimated prevalence by the ratio of the overall visit rate to the visit rate for the specific condition. Thus, the adjusted prevalence of diabetes was 10.1 percent (11.9 percent × [6.8/8.0]); the adjusted prevalence of hypertension was 42.3 percent (42.9 percent × [6.8/6.9]). These rates are relatively similar to the original unadjusted estimates.

Specific visit rates were not available for the other less common conditions; however, their adjusted prevalences could not have been significantly higher than the initial estimates unless actual visit rates were very much lower than the overall average. For example, for the adjusted prevalence of dementia to equal 10 percent would have required that the visit rate for patients with dementia was 0.27 (10 percent = 0.4 percent × [6.8/0.27]) visits annually (or 96 percent lower than the visit rate for the average practice patient).

## Discussion

Based on the review of medical records reported here, the treatment of hypertension and diabetes was either similar for old and young patients or somewhat more thorough for the older patients than younger patients. Blood pressure in the older hypertensive patients was less well controlled than in younger ones, but this finding may have been due to differences in the disease process. Both pseudohypertension and isolated systolic hypertension are more prevalent among older patients. Alternatively, the less stringent control of hypertension in the patients 65 and over may have reflected physicians' doubts about the significance of systolic hypertension and/or concern over possible adverse reaction (for example, orthostatic hypotension) to the antihypertensive drugs.

A large proportion of the older patients was treated for hypertension and diabetes; however, geriatric conditions such as dementia, osteoporosis, and incontinence were not as prevalent as found in systematic community surveys reported in the literature. It is unlikely that the present results were due solely to underrepresentation of the very oldest (that is, those over 75 or 85) in the practices; those over 75 accounted for 34 percent of the practice patients 65 and over, compared with 39 percent nationwide (1).

The failure to find geriatric conditions was not likely to be due to the limitations of chart review. This study was performed in teaching hospitals where charts are likely to be more complete than in other medical facilities. Notes were available not only from the group practices but also from all specialty services. Diagnoses were recorded whenever and wherever visits occurred, and up to 20 diagnoses were recorded for some patients.

The infrequent reporting of geriatric conditions suggests two possibilities. First, the practice patients may have been atypically healthy. Patients with functional and cognitive impairment may have found it impractical to be seen in a university practice by residents. If true, this explanation would indicate an important deficiency in the clinical content of residency training. An alternative explanation is that the geriatric conditions may not have been recognized or considered sufficiently important to mention in the medical record. This latter explanation would be consistent with other studies reporting that dementia (13) and incontinence (14) are frequently unrecognized by physicians. Thus, the results presented in this paper would indicate the need to increase the emphasis on geriatric clinical topics within residency training programs. At the very least, training programs should ensure that residents are involved in the long-term care of sufficient numbers of frail older patients. Furthermore, the faculty attending physicians and preceptors need to stress the detection and management of those clinical problems common among the old and the very old. These steps are necessary if the medical profession is to meet the challenge posed by the recent and projected growth of the older patient population.

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# JOURNAL OF Medical Education

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Introductory Course in Biomedical Ethics
in the Obstetrics-Gynecology Residency
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# Career Plans and Debt Levels Of Graduating U.S. Medical Students, 1981–1986

*Cynthia Tudor, Ph.D.*

**Abstract**—Trends in students' responses to the annual graduation questionnaire of the Association of American Medical Colleges from 1981 to 1986 were examined. Since 1981 the percentage of students choosing primary care specialties dropped from 43.6 percent to 36.6 percent. The decline of interest in primary care specialties occurred mainly in general internal medicine. Changes in career activity since 1981 reflected increasing interest by the students in full-time academic appointments and decreasing interest in solo, private practices. Changes in the size of a city in which students planned to practice reflected an increasing interest in large cities or suburbs. The students' preferences for certain geographic regions of the country for practice locations changed very little. Finally, total postsecondary educational debt increased from an average of $19,697 in 1981 to an average of $33,499 in 1986. This difference represents a 70 percent increase as measured by 1987 dollars and a 37 percent increase in constant dollars.

A graduation questionnaire (GQ) is administered annually by the Association of American Medical Colleges (AAMC) to all graduating seniors at U.S. medical schools. The questionnaire has been completed by approximately 65 to 70 percent of each graduating class since it was first administered in 1978. The analysis reported here examined trends from 1981 through 1986 in the responses to the GQ.

Since all graduates do not complete the graduation questionnaire, underrepresentation by a group in the sample of GQ respondents may bias the findings. For example, blacks comprised 5.1 percent of the 1986 graduating class but only 3.6 percent of the GQ respondents. Since blacks are more likely to locate in a socioeconomically deprived area than are whites, GQ results may underestimate the extent to which medical school graduates are likely to locate in these areas. Responses to the GQ seem to reflect accurately the sex distribution and public/private school distribution of 1986 graduates.

Table 1 shows the choice of specialization for students who had definitely decided on a specialty by the time they completed the questionnaire. The percentage of students choosing primary care specialties (family practice, general internal medicine, general obstetrics-gynecology, and general pediatrics) dropped from 43.6 percent in 1981 to 36.6 percent in 1986. The decline of interest in primary care specialties occurred mainly in gen-

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Dr. Tudor is director of student studies, Section for Student and Educational Programs, Association of American Medical Colleges, Washington, D.C.

TABLE 1

**Percentages of U.S. Graduating Medical Students with Definite Preferences Who Preferred Each of 25 Specialties, 1981 Through 1986***

| Specialties | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|
| Allergy and immunology | 0.2 | 0.1 | 0.2 | 0.2 | 0.2 | 0.3 |
| Anesthesiology and critical care | 4.2 | 5.0 | 5.5 | 6.2 | 6.6 | 6.0 |
| Dermatology | 1.2 | 0.9 | 1.2 | 1.4 | 1.6 | 1.8 |
| Emergency medicine | 2.6 | 2.4 | 2.7 | 3.0 | 3.0 | 3.5 |
| Family practice | 17.3 | 18.2 | 17.7 | 17.0 | 15.9 | 17.0 |
| Internal medicine | | | | | | |
| General | 12.7 | 13.9 | 12.7 | 10.4 | 10.3 | 8.3 |
| Subspecialties | 5.9 | 3.1 | 3.7 | 3.9 | 4.6 | 5.0 |
| Neurology and child neurology | 1.4 | 1.9 | 1.6 | 2.1 | 2.3 | 2.6 |
| Nuclear medicine | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Obstetrics-gynecology | | | | | | |
| General | 6.3 | 7.4 | 6.8 | 7.7 | 6.0 | 5.9 |
| Subspecialties | 1.6 | 1.0 | 1.1 | 1.1 | 1.2 | 1.3 |
| Ophthalmology | 3.8 | 3.9 | 3.8 | 3.9 | 4.0 | 4.2 |
| Pathology | 2.5 | 2.7 | 3.1 | 2.4 | 2.1 | 2.1 |
| Pediatrics | | | | | | |
| General | 7.3 | 6.8 | 6.5 | 6.6 | 5.6 | 5.4 |
| Subspecialties | 1.5 | 0.7 | 0.8 | 0.8 | 1.0 | 1.3 |
| Physical medicine and rehabilitation | 0.6 | 0.6 | 0.9 | 0.9 | 1.3 | 1.6 |
| Preventive medicine | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 | 0.2 |
| Psychiatry and child psychiatry | 4.8 | 5.2 | 5.0 | 4.7 | 6.0 | 6.4 |
| Radiology and subspecialties | 5.3 | 5.3 | 6.1 | 6.5 | 6.6 | 6.2 |
| Surgery | | | | | | |
| General | 6.3 | 6.0 | 5.5 | 6.0 | 6.1 | 6.2 |
| Subspecialties† | 3.1 | 2.3 | 2.5 | 2.6 | 2.2 | 2.2 |
| Neurological surgery | 1.3 | 1.1 | 1.1 | 0.9 | 1.1 | 0.9 |
| Orthopedic surgery | 6.0 | 6.9 | 6.6 | 6.4 | 6.6 | 6.7 |
| Otolaryngology | 2.0 | 2.5 | 2.3 | 2.3 | 2.6 | 2.6 |
| Urology | 1.3 | 1.6 | 1.8 | 2.3 | 2.4 | 2.1 |
| No specialty specified | 0.6 | 0.2 | 0.5 | 0.4 | 0.6 | 0.3 |

* The percentages represent only those respondents who had definitely decided on a specialty: 1981 = 10,795 responded to questionnaire, 8,809 had preference; 1982 = 10,938 responded, 8,097 had preference; 1983 = 10,481 responded, 7,747 had preference; 1984 = 10,547 responded, 7,752 had preference; 1985 = 11,048 responded, 8,114 had preference; and 1986 = 10,739 responded, 7,657 had preference. Columns may not total 100 percent due to rounding.

† Includes critical care, pediatric, plastic, thoracic, and colon and rectal surgery subspecialties.

eral internal medicine, which dropped from 12.7 percent in 1981 to 8.3 percent in 1986. The percentages choosing anesthesiology, emergency medicine, neurology and child neurology, psychiatry and child psychiatry, radiology, and orthopedic surgery increased slightly.

The students' responses concerning choice of career activity revealed few changes since 1981, as shown in Table 2. The percentage of students desiring to practice medicine alone decreased from 5.0 percent in 1981 to 3.4 percent in 1986, while the percentage choosing clin-

**TABLE 2**

**Percentages of U.S. Graduating Medical Students Who Preferred Different Career Activities, 1981 Through 1986***

| Career Activities | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|
| Full-time academic faculty appointment | | | | | | |
| Basic science teaching and research | 1.0 | 0.9 | 1.1 | 1.2 | 1.2 | 1.0 |
| Clinical science teaching and research | 21.5 | 20.9 | 23.3 | 22.5 | 26.4 | 26.7 |
| Salaried research scientist position | | | | | | |
| Basic medical sciences | 0.2 | 0.1 | 0.2 | 0.3 | 0.2 | 0.2 |
| Clinical sciences | 0.5 | 0.3 | 0.4 | 0.5 | 0.3 | 0.3 |
| Private clinical practice | | | | | | |
| Alone | 5.0 | 4.3 | 3.9 | 3.8 | 3.3 | 3.4 |
| In participation with one other physician | 11.3 | 11.7 | 10.7 | 11.0 | 9.3 | 9.3 |
| In a group of three or more physicians | 35.2 | 36.2 | 35.1 | 36.4 | 35.2 | 35.7 |
| Undecided among the other private practice options | 12.0 | 12.2 | 11.4 | 11.3 | 10.1 | 9.4 |
| Salaried clinical practice | | | | | | |
| Hospital | 6.4 | 6.1 | 6.4 | 6.4 | 6.1 | 6.2 |
| Prepaid group clinic | 2.9 | 2.3 | 2.6 | 2.6 | 2.7 | 2.6 |
| State or federal agency | 3.0 | 3.7 | 3.7 | 3.4 | 3.2 | 3.1 |
| Administrative position—no practice | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Other | † | † | † | † | 1.3 | 1.4 |
| No response | 0.7 | 0.9 | 0.8 | 0.6 | 0.6 | 0.5 |

* The numbers of respondents for each year were: 1981 = 10,795, 1982 = 10,938, 1983 = 10,481, 1984 = 10,547, 1985 = 11,048, and 1986 = 10,739. Percentages in each column may not total 100 due to rounding.

† "Other" response not included in questionnaire in these years.

ical practice with a group of three or more physicians increased slightly. The percentage of students choosing a prepaid group clinic as their practice location remained stable at about 3 percent.

The percentage of students who chose a full-time academic appointment as their primary career interest increased from 22.5 percent in 1981 to 27.7 percent in 1986. However, data extracted from the AAMC's Medical College Faculty Roster System show that almost 20 percent of medical school graduates become faculty members within 10 years of graduation. Thus, the percentage of graduates who actually begin a full-time academic career is less than the percentage who chose an academic appointment as their primary career interest at graduation. This difference may reflect merely the difference between aspirations and achievement.

Only about one-fifth of the graduating students in 1986 planned to take a research fellowship. This percentage dropped from about 24.4 percent in 1981 to the 1986 level of 20.1 percent. This proportion reflects a declining percentage of students who planned a research fellowship and an increasing discrepancy between those who desired an academic career and who planned a research fellowship since 1981. A research fellowship is considered by many to be a prerequisite to an academic career. However, the GQ question concerning a research fellowship was changed in 1984 to include an "undecided" category. If the respondents in 1986 who were undecided are distributed between the "yes" and "no" categories in the same proportion as those who were decided, then the percentage of students who actually planned a research fellowship would be 27.5 percent. The percentage who had decided against a fellowship would be 72.2 percent. These adjusted figures show an increase since 1981 in the percentage of respondents who plan a fellowship, an increase that is in line with the increase in those who plan an academic career. Thus, the adjusted proportion of students who in 1986 planned a fellowship (27.5 percent) is approximately the same as the proportion of students that year who planned a full-time academic career (27.7 percent).

Graduating medical students changed the choice of their practice setting locations since 1981. For example, the percentage of students desiring to practice in a suburb of a large city increased from 10.3 percent in 1981 to 15.0 percent in 1986. In contrast, the percentage desiring to practice in small-size cities or towns dropped from 23.8 percent in 1981 to 16.4 percent in 1986.

The region of the country in which students planned to practice remained fairly stable over the six years. Approximately 24.1 percent of the respondents in 1986 planned to practice in the northeast, while 21.8 percent and 20.7 percent planned to practice in the south and west, respectively; 18.2 percent planned to practice in the midwest, and 13.1 percent were undecided.

From 1981 through 1983, graduating students were asked whether they would consider locating in a socioeconomically deprived area. The results showed that over half of the respondents in each year would consider this practice location. However, in 1984 the question was changed to, "Do you plan to locate in a socioeconomically deprived area?" To that question, only 15.2 percent of the respondents in 1986 answered affirmatively.

Table 3 shows the amounts of total postsecondary educational debt incurred by respondents to the questionnaire. Until 1986 the percentage of students who had incurred no debt decreased, from about 23 percent in 1981 to 13 percent in 1985. In 1986, however, the percentage of students who had not incurred any debt increased to 18 percent.

Variations in the distribution of debt from 1981 to 1986 may be attributed to several changes in response patterns. First, there has been an increase since

TABLE 3

**Percentages of U.S. Graduating Medical Students Who Reported Amount of Total Educational Debt at Each Debt Level, 1981 Through 1986***

| Amounts | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|
| No debt | 23.0 | 17.1 | 13.8 | 11.9 | 13.4 | 17.9 |
| $1 to $4,999 | 4.8 | 4.3 | 3.5 | 2.9 | 2.7 | 3.1 |
| $5,000 to $9,999 | 8.7 | 7.6 | 6.4 | 6.3 | 8.8 | 6.2 |
| $10,000 to $14,999 | 11.8 | 11.3 | 9.5 | 9.9 | 6.3 | 5.4 |
| $15,000 to $19,999 | 15.7 | 17.3 | 15.2 | 9.4 | 7.0 | 6.2 |
| $20,000 to $24,999 | 12.2 | 14.9 | 16.6 | 16.8 | 12.9 | 10.2 |
| $25,000 to $29,999 | 9.2 | 9.0 | 10.2 | 11.3 | 10.3 | 9.7 |
| $30,000 to $49,999 | 13.0 | 15.5 | 20.0 | 23.5 | 25.8 | 24.6 |
| $50,000 or more | 1.5 | 2.9 | 4.7 | 8.1 | 12.8 | 16.8 |

* The numbers of respondents to the question on debt were: 1981 = 8,148, 1982 = 10,498; 1983 = 10,073, 1984 = 8,041, 1985 = 10,844, and 1986 = 10,623. Totals in each column may not total 100 due to rounding.

1981 in the number of students who provided information on whether or not they had incurred educational debt. Second, the types of individuals who responded to the questionnaire changed. In particular, there were changes in the proportion of each racial or ethnic group that responded to the questionnaire. Analysis of the reasons for the changes continues.

The general decline in the proportion of students who incurred no debt was accompanied by an increase of 15 percentage points in the proportion of students with debts exceeding $50,000 (from 2 percent in 1981 to 17 percent in 1986). The average debt for indebted respondents rose from $19,697 in 1981 to $33,499 in 1986, a 70 percent increase as measured by 1986 dollars. In constant 1981 dollars, the 1986 debt represented $27,069. In constant dollars, the average debt increased by about 37 percent.

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# The Regional Graduate Medical Education Program Of the University of Washington

*David C. Dale, M.D., Benjamin H. Belknap, M.D., John D. Chase, M.D., and James W. Haviland, M.D.*

**Abstract**—To address problems of geographic and specialty distribution of physicians in the states of Washington, Alaska, Montana, and Idaho, the University of Washington School of Medicine and its affiliated hospitals developed a regional program of graduate medical education beginning in 1971. The program in 1986–87 had 77 percent of the residency positions in the region and involved more than 30 hospitals and clinics. In 1986–87, 58 percent of the residents completing training were in family medicine, internal medicine, or pediatrics. The program is centrally coordinated by the school's associate dean for clinical affairs, who works with departmental program directors and hospital and university administrators.

The cost, content, and control of programs for graduate medical education (GME) are currently matters of public and professional controversy. A number of reports (1–4) in this decade have addressed problems with the training of the nation's 75,000 residents, training that now costs almost $3 billion annually.

The present system of GME reflects the balancing of the interests of several groups: the Accreditation Council for Graduate Medical Education (ACGME), specialty boards and specialty societies, hospital boards and administrators, medical school deans and faculties, residency program directors, residents, and the medical profession at large. Many have suggested changing this system by restructuring GME to emphasize its educational elements, regulating the size of programs to match more closely the needs for physicians trained in various specialties, focusing control of programs in publicly appointed committees or boards, and shifting more of the responsibility for oversight of GME either to teaching hospitals or to medical schools.

In 1971 an ad hoc Committee on Graduate Medical Education of the Association of American Medical Colleges (AAMC) recommended unifying responsibility for GME under the direction of medical schools and their parent universities (5). Although a policy statement based on this report was adopted in principle by the assembly of the AAMC, for many reasons its implementation has occurred slowly.

Concomitant with the AAMC study and other plans for reorganizing GME (6), the University of Washington School of Medicine in 1971 began a major regional medical education program for the

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states of Washington, Alaska, Montana, and Idaho called the WAMI program. This program was begun to improve access to medical education for three states without medical schools (Alaska, Montana, and Idaho) and to match more closely the overall educational efforts of the existing school with the needs of the region. A part of this effort involved developing a regional GME program.

The present report describes the GME program that was developed by the University of Washington and its affiliated hospitals. In 1986–87 the program had 687 residents (77 percent of the residents in the WAMI region) working in more than 30 hospitals and clinics in the four-state area.

## Description

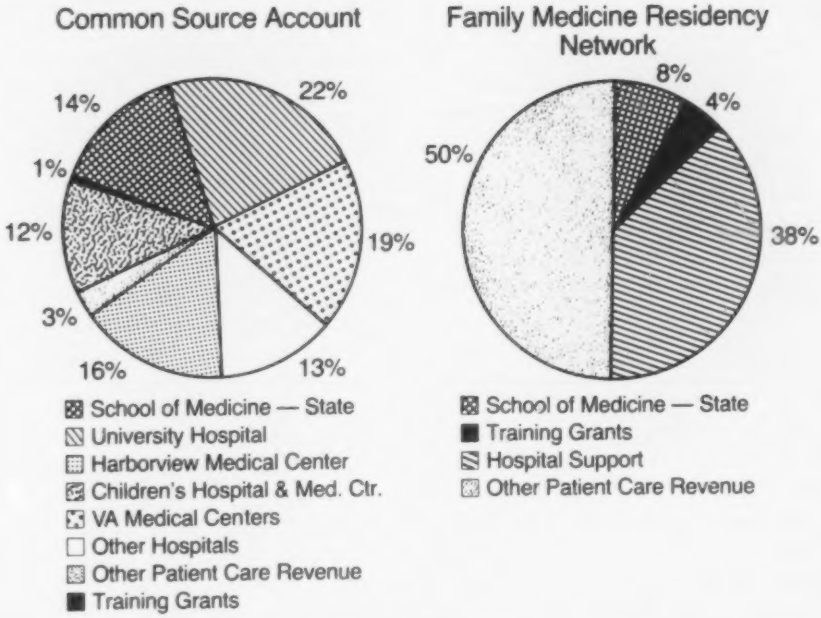
The University of Washington School of Medicine was begun in 1945. Before the school opened, there were several internship programs and a few residency positions in the region, principally in Seattle, Tacoma, and Spokane. With the beginning of the University Hospital in 1959, it was decided that there should be single residency programs spanning multiple hospitals for each department under the auspices of the school. This was a key decision for long-term interhospital and interdepartmental cooperation and for the gradual amalgamation of regional GME positions into the university-based programs.

At approximately the same time the WAMI program began, a Department of Family Medicine and a network of family practice residencies were started (7, 8). Also, rotations to remote clinical units were begun in internal medicine, pediatrics, psychiatry, and surgery (9). In general, the school followed a deliberate strategy of expanding training in the primary care disciplines and selectively added residency positions so that each beginning resident could complete training in the region.

### FUNDING AND ADMINISTRATION

Since 1960 some of the school's state support, the portion received through the university budget, has been used to fund directly the cost of the GME program, including residents' stipends. As the overall program grew and as the school sought to develop new contractual arrangements for resident rotations at remote sites, it became clear that a uniform salary agreement, with a single salary schedule and common fringe benefits, would be helpful. In the mid-1970s, a "Common Source Account," a self-sustaining account of the university, was created together with a standard interinstitutional agreement for the participating hospitals and clinics (except for the "Family Practice Residency Network," which was handled separately). The essential elements of this interinstitutional agreement were: to set numbers and levels of residents for each department at each hospital each year; to establish base salaries, fringe benefits, and payroll management fees; and to set billing and payment dates for the operation of the account. In 1986–87 more than 20 institutions participated in funding resident positions through this agreement. The family practice program receives direct state support [illegible] from the support received through the university budget) and support from a number of hospitals; it has a separate accounting and governance structure. The current sources of support for the GME program are shown in Figure 1.

The centralized management of a highly integrated GME program depends upon a cooperative spirit and farsightedness. From the hospitals' perspective, development of the cooperative program


Common Source Account

Family Medicine Residency Network

FIGURE 1

Percentages of funding for residents' stipends and benefits received from various sources by residency programs of the University of Washington (with the family practice program shown separately because it is administered separately from all other programs), 1986–87.

meant that they would be provided with good residents without the duplication of costs associated with maintaining their own systems for selecting, overseeing, and compensating residents. It also meant that the school would assume responsibility for maintaining program accreditation and for providing malpractice insurance for residents and for faculty members while engaged in teaching activities. The cooperation of the hospitals helped the school and its departments to attract better residents and to integrate its undergraduate and graduate medical education. The departments have kept their traditional responsibilities for selecting residents and supervising their clinical and educational activities.

A number of individuals are involved in managing the GME program. Although the program is accountable to the university president through the vice president for health sciences, most issues are resolved among the associate dean for clinical affairs in the School of Medicine, the hospital medical directors, and the program directors for the individual departments. The associate dean for clinical affairs coordinates the interest of the school's clinical departments with the resources and programs of hospitals and clinics in the region. That person also works with the ACGME and the residency review committees and with groups interested in health manpower needs of the region.

For the family medicine network, an advisory board chaired by the dean of the medical school, provides governance and oversees the expenditures of state funds. This board is appointed by the governor of the state of Washington and includes lay and physician members.

Oversight for all the programs based in the three participating Veterans Administration hospitals (Seattle and Tacoma-American Lake in Washington and Boise, Idaho) is provided by a dean's committee for each institution.

### PROBLEMS

The principal problem in maintaining the program is uncertainty about whether the federal government and other payers for hospital services will continue to pay for the direct and indirect costs of GME. A parallel concern is not knowing whether the teaching hospitals in the region can remain competitive with other hospitals. This dilemma is of greatest concern where hospital resources have been used to support residency programs in primary care, particularly in family medicine. The ambulatory care clinics required for these programs are relatively expensive to operate; they continually receive close budgetary scrutiny as hospital finances tighten. The organization, staffing, and efficient management of clinics for training residents are now important concerns in nearly every specialty.

Operating a widely dispersed GME program with centralized accounting and record-keeping requires good communication and coordination among the departments, the hospitals, and the the office of the associate dean for clinical affairs. Recently, a computer-based record-keeping system was developed. Indexing salaries to national averages for resident salaries, having clearly defined fringe benefits for residents, and anticipating problems through a faculty-house staff committee have proven very helpful.

### Effects

In examining the effects of the WAMI program, the present authors considered the residents' specialties in the following seven categories: primary care specialties (general internal medicine and medical specialties, family practice, and general pediatrics and pediatric specialties); obstetrics and gynecology; psychiatry, including child psychiatry; general surgery, including plastic and thoracic surgery; surgical specialties (neurosurgery, ophthalmology, otolaryngology, orthopedics, and urology); hospital-based specialties (anesthesiology, nuclear medicine, pathology, radiation oncology, and radiology); and other specialties (dermatology, neurology, and rehabilitation medicine). Obstetrics and gynecology was not grouped with the primary care specialties, as done in some (1) but not all (3) reports.

The size of the residency programs in the WAMI network in 1986–87 and the average number of WAMI residency graduates from 1980 through 1986 are shown in Table 1, and the percentages of residents in training and graduating in various specialties are shown in Figure 2. Figure 2 shows a steady increase in the average percentages of trainees and graduates in the primary care specialties (internal medicine, family practice, and pediatrics) over the last 25 years. Because the years of training required in surgical and other specialties have increased but the number or percentage of positions allocated to them has changed little, the percentage of graduates in these specialties has steadily fallen.

Table 1 also gives estimates of the number of new physicians needed for the WAMI region and the output of the university program and of all programs in the region combined. In nearly every specialty or group of specialties, the annual output during 1980–1986 was less than

### TABLE 1

**Numbers of Trainees and Graduates of the University of Washington Residency Program, Numbers of Graduates of All Residency Programs in the WAMI Region, Numbers of Physicians in the Region, and Estimates of Physicians Needed in the Region**

| | | | | Based on AMA Data* | | Based on GMENAC Report† | | Based on HMO Staffing‡ | |
|---|---|---|---|---|---|---|---|---|---|
| Residency Programs§ | Total No. of UW Residents, 1986–87 | Average No. of UW Residency Graduates per Year, 1980–1986 | Average No. of Residency Graduates, Whole WAMI Region, per Year, 1980–1986 | No. of M.D.s in WAMI Region, 1985 | Estimated No. of New Physicians Needed in WAMI Region Each Year** | Total No. of Physicians Required in WAMI Region in 1990 | No. of New Physicians Needed in WAMI Region Each Year in 1990** | Total No. of Physicians Required in WAMI Region in 1990 | No. of New Physicians Needed in WAMI Region Each Year in 1990** |
| Primary care specialties | | | | | | | | | |
| Family medicine | 150 | 52.0 | 52.0 | 2,400 | 68.5 | 2,570 | 83.0 | 3,875 | 111.0 |
| Internal medicine | 153 | 41.5 | 57.5 | 2,113 | 60.0 | 3,685 | 105.0 | 1,700 | 48.5 |
| Pediatrics | 50 | 15.5 | 20.5 | 696 | 20.0 | 1,115 | 32.0 | 775 | 22.0 |
| Obstetrics-gynecology | 20 | 5.0 | 10.0 | 631 | 18.0 | 735 | 21.0 | 770 | 22.0 |
| Psychiatry | 42 | 11.0 | 11.0 | 638 | 18.0 | 1,455 | 41.5 | 300 | 8.5 |
| General surgery | 50 | 5.5 | 12.5 | 890 | 25.0 | 865 | 25.0 | 450 | 13.0 |
| Surgical specialties | 59 | 12.5 | 18.5 | 1,340 | 38.0 | 1,375 | 39.0 | 1,410 | 40.0 |
| Hospital-based specialties | 112 | 30.0 | 38.0 | 1,490 | 42.5 | 1,710 | 49.0 | 1,377 | 39.0 |
| Other specialties | 51 | 14.5 | 14.5 | 412 | 12.0 | 485 | 14.0 | 304 | 8.5 |
| Total | 687 | 187.5 | 223.5 | 10,610 | 302.0 | 13,995 | 400.0 | 10,961 | 313.0 |

* For source of data, see reference 10.

† For source of data, see reference 1.

‡ For explanation, see text.

§ For breakdown of specialties, see text.

** Derived by dividing total requirement for entire region by 35 (the estimated number of years a physician will practice).

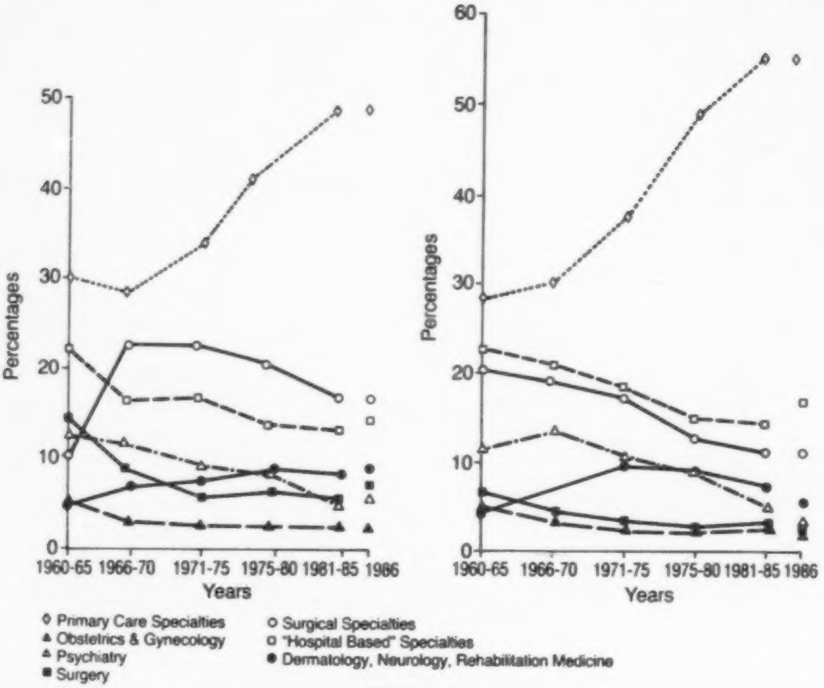


FIGURE 2

Average percentages of residents training in and graduating from residency programs in various categories of specialties (left panel based on actual number of residents working in each department each year; right panel based on actual number of residents in final year of training, as required for board certification in that specialty, each year), University of Washington, 1960–1986.

the projected requirement for the region, based on the data from the Graduate Medical Education Advisory Committee (GMENAC) or a simple equilibrium model in which new physicians replace physicians in practice at retirement after 35 years of practice. The only exception was the residency program in rehabilitation medicine, which produced more physicians each year for 1980–1986 than the estimated need. Rehabilitation medicine is, however, a specialty considered nationally to be undersupplied in the GMENAC study (1).

The number of GME graduates per year was also less than that which would be required for a hypothetical health maintenance organization (HMO) serving the whole WAMI region and staffed similarly to the Group Health Cooperative of Puget Sound, the largest HMO in the region (Table 1). If the expected practice time for physicians is extended to 40 years or reduced to 30 years, the GME program output would still be less than the projected regional need by any of these estimates.

A recent survey of the school's residency program directors, conducted as part of the preparation for the present report, revealed that only in family medicine, general internal medicine, general pediatrics, and psychiatry did the directors perceive a need for more than replacement numbers of new physicians in the WAMI region. This finding is not surprising given the changes in physician supply in this region between 1970 and 1985: the number of physicians increased by 88 percent, the population-to-physician ratio declined by 30 percent, and 53 percent of the physicians in the region as of 1985 were less than 45 years old (10). Although there are still towns and villages without a doctor, as of December 1985 no county (or borough, in Alaska) in the WAMI region with a population density greater than three people per square mile (national average, 67 per square mile) lacked a physician (10).

## Discussion

This paper summarizes the history and operation of the GME program of a school with a long-term commitment to matching its training efforts to the needs for physicians in a large geographical region. Although the University of Washington School of Medicine is in some ways unique among the nation's medical schools and provides GME for only about 1 percent of the nation's resident physicians, its approaches to addressing major issues in GME may be useful for others considering these same concerns.

In the 1985 report of the Task Force on Academic Health Centers, sponsored by the Commonwealth Fund and titled "Prescription for Change," GME was listed first of three major topics in need of public understanding and examination (2). Cost, size, control, program content, and specialty distribution were highlighted as issues in this report. Similar issues were considered in the 1986 report of the New York State Commission on Graduate Medical Education (3) and elsewhere (4). Although these issues are closely interwoven, a key issue emerging in most reports is that of program management or control.

The strategy adopted at the University of Washington for oversight of GME is largely that proposed by the AAMC in 1971 (5) and similar to the system proposed for Michigan in 1974 (6) and New York in 1986 (3). The School of Medicine serves as the coordinating institution and the associate dean for clinical affairs as the manager for GME in the WAMI region.

With this organizational structure, the school and its affiliated hospitals have managed to maintain a high quality of residency training, as reflected by program approval by the ACGME and by demand for the training positions, and to create changes in the GME program which the school believes reflect appropriate responses to major national issues. The residency programs have grown but in a controlled way. The northwest and the WAMI region presently have the lowest number of entering GME positions per capita of any region in the United States, yet there are sufficient positions for the numbers of medical students who graduate from the University of Washington.

Estimates of the number of physicians required in the region based on a replacement model, the GMENAC study, and a comparison of the program's output with the staffing needs of the Group Health Cooperative all suggest that the proportion of trainees in various specialties is, in general, a reasonable match with the projected needs for the region by specialty but that the program's annual output is somewhat less than the region's projected annual need. On the other hand, a number of factors now indicate that little further growth can be justified. Although only about 50 to 60 percent of the school's GME graduates will remain in the WAMI states, based on a study (11) published in 1986, and a number will enter academic careers, there is every reason to believe that physician migration to the northwest will continue to make up for the shortfall.

In terms of costs, there are significant savings to the health care payers of the region because of the present size of the program. The difference between the 1986–87 ratio of residents to population (4.1 residents/100,000 population) compared with the national average (6.0 residents/100,000 population) can be translated to an estimated savings of about $5 million per year in direct educational cost for the WAMI states (12). Given the close linkage of physician supply and overall health care costs, substantially larger savings may have accrued and may continue to accrue if, by having smaller programs or a better balance of training programs, the region has avoided an excessive or inappropriate physician supply.

In the early 1970s, as part of managing the size of its GME program, the school adopted a deliberate strategy to limit the growth of many of its specialty programs and to permit some other programs to grow. The changes shown in Figure 2 can be compared with national data for this same period. Nationally, there was an overall increase of 16 percentage points in the proportion of positions in family medicine, internal medicine, and pediatrics between 1970 and 1985 (from 25 to 41 percent of these residency positions) (13). The proportion in these specialties grew by 19 percentage points in the WAMI program over this same period (from 33 to 52 percent of the positions) with the creation of 222 new positions in the school's residency programs in family medicine, internal medicine, and pediatrics. In 1986–87, 58 percent of the residents were completing training in these specialties. Follow-up studies have shown that a substantial proportion of the WAMI's GME graduates in family medicine (14) and internal medicine (9) practice as generalists and live in small communities in this region.

In reviewing the operation of this GME program, four key factors have helped the program to work well. First, financial resources derived from several sources are centrally coordinated. The school has had state, federal, and foundation funds to support the educational component of the GME program and to facilitate program changes. The understanding that binding financial arrangements for GME are made between the school's associate dean for clinical affairs and the hospital directors and/or administrators and not between the hospital directors and/or administrators and the department chairmen has been critical.

A second factor is the program's consistent effort to develop data on GME and physician manpower in this region. Although no comprehensive data base has been maintained, studies such as a comparison of residency program output and HMO manpower needs that was done in the early 1970s and follow-up studies on the location of former students and residents have been powerful influences in shaping the GME effort.

A third factor is a regular discussion forum for program directors and hospital administrators. For many years these individuals have met monthly to discuss hospital and GME problems and work to develop a consensus for their resolution. From these meetings have come improved mutual understanding of otherwise independent programs and an institutional commitment to flexibility, cooperation, and change.

A fourth key factor in managing the GME program successfully is maintenance of a long-range perspective. Most changes in program size or content must be anticipated by about two years if they are to be managed smoothly. Similarly, the long-term effects of resident selection are important but sometimes difficult to anticipate. For example, the slow and planned expansion of the GME program with few foreign medical graduates accepted for training appears to have resulted in relatively low percentages and numbers of foreign graduates who practice in this region (15). This result occurred despite the fact that state licensure requirements are not a barrier to foreign physicians.

Nationally, it is now well recognized that the size, content, and location of GME programs are important factors in influencing the geographic and specialty distributions of physicians and health care costs. At present, the federal government seeks to control some of these factors through policies that limit hospital reimbursement for educational costs, but whether this strategy will be effective is uncertain. The experience described in the present report suggests that a medical school working in close cooperation with its affiliated hospitals can foster and manage a high-quality GME program that controls its size and costs and the distribution of the specialists it trains.

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# Stressors and Psychological Symptoms Of Family Practice Residents and Spouses

*Mary F. Smith, Frank Andrasik, Ph.D., and Stephen J. Quinn*

**Abstract**—Fifty-nine family practice residents and their spouses from one university-based and three community-based residency programs were studied to assess the frequency of stressful events in their lives and to quantify adverse psychosocial effects associated with that stress. A modified version of a questionnaire produced and tested by the University of Minnesota and the widely used, standardized Symptom Checklist-90 (SCL-90) were used to assess stress and psychological symptoms. There was a high correlation between high numbers of stressful events in the residents' and spouses' lives and high ratings of psychological symptoms. This finding was particularly true for the female residents. Overall, the residents' responses were near the mean for a nonpatient group used as a normative comparison on each of the nine subscales of the SCL-90 and on the overall mean for the entire scale. This finding indicated that the residents, although their lives were quite stressful, were handling the stress without major problems. The residents and their spouses also answered questions about 10 therapeutic interventions concerning stress and indicated which interventions they preferred.

In the lay and professional literature there is frequently some discussion of stress and its deleterious consequences. Several different sources indicate that physicians may be particularly prone to the damaging effects of stress (1–3). Suicide and divorce rates are higher among physicians than other professionals. House staff officers have been designated by the American Medical Association as a group at risk (3). Further, physician impairment is doubly serious because the effects are not limited to that individual and immediate family. Such impairment can lower the quality of patient care and, in the extreme case, can cause harm to the patient. The pervasiveness of these consequences indicates that those responsible for educating physicians need a sound understanding of physician impairment, the factors that cause it, and the preventive and/or therapeutic measures to be undertaken in graduate medical education programs to neutralize the possible damaging effect that high levels of stress can have on physicians' lives and practices.

Examination of the literature on stress

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in medical education and residency programs in particular reveals that most articles are theoretical or position papers (4, 5), are anecdotal or otherwise uncontrolled reports (6, 7), or are concerned exclusively with undergraduate medical education, which may not be sufficiently similar to postgraduate medical education to allow comparison (8).

The present study was undertaken to examine factors that might hinder or prevent successful completion of a residency. The authors' specific purpose was to assess and categorize the occurrence of stressful events in the lives of family practice residents and determine whether these stressors were associated with demonstrable effects on the psychosocial functioning of the residents and their spouses.

In 1976 Nelson and Henry (9) at the University of Minnesota similarly analyzed the stressors that residents experienced but did not examine psychosocial sequelae or effects on the residents' spouses. The stress scale used in this Minnesota investigation has no normative data by which to judge the clinical significance of the scores they obtained, and neither do other existing stress scales. One way to assess the clinical significance of stress scores is to compare scores on a stress instrument with scores obtained by the same individual on a standardized psychosocial inventory.

## Method

In the present study, a sample of residents completed a revised version of the Minnesota scale used by Nelson and Henry and a broad-spectrum psychological inventory, the Symptom Checklist-90 (SCL-90) in order for the investigators to quantify objectively any adverse psychosocial effects of stress. The SCL-90 was used in another investigation of stress in a graduate training program in 1984 (10). Scores from the residents in the present study were compared with those of psychiatric outpatients and nonpatient control groups taken from the SCL-90 manual (11). Finally, the residents and their spouses indicated which of a series of therapeutic interventions (that is, preventive or remedial programs to counter stress) they preferred.

The participants were residents in four family practice programs in or near Albany, New York: Albany Medical College Department of Family Practice; Mid-Hudson Family Health Services Institute, Kingston; St. Clare's Hospital, Schenectady; and St. Elizabeth's Hospital, Utica. The Albany program is university-based, while the other three are community-based. All the residents ($n = 62$) and spouses ($n = 46$) from the four programs were invited to be a part of this study.

In the first six months of 1985, the authors met alone with each program director and then with the program director and the residents together at each of the four locations to discuss the purpose of the study and to encourage the residents to participate. At the group meeting the questionnaires were distributed to the residents and, depending on the time allotted for this meeting, the residents did or did not complete the survey. The spouses were not included at this point, and married residents took test packets to their spouses. Those residents who did not attend the meeting were mailed a packet for themselves and their spouses. One follow-up letter was sent to each resident to encourage completion and return of the survey packet and to express appreciation for participation. Participation was entirely voluntary, and complete anonymity was guaranteed.

Each test packet included the revised version of the Minnesota scale, the SCL-

90, and the questions about preventive or remedial programs. Ten program options were listed, and the respondents were asked to state whether the proposed program should be offered and whether they would be likely to attend. Both questions required a yes-no response. The respondents were then asked to rank-order the top three choices of interventions they would participate in if they were offered in their residency.

In the original version of the scale used by Nelson and Henry (9), the male residents answered either yes or no as to whether each of 130 potentially stressful situations existed in their lives; the female residents answered 138 and the spouses 110 questions. However, the present authors thought that few situations are so clear that they can be answered yes or no. Also, completing the original survey probably required several intervening decisions on the part of the resident (such as making judgments about the degree to which the stated problem was present in their lives and establishing idiosyncratic criteria for deciding whether an item was a problem). To alleviate these difficulties, the authors modified the original questionnaire (hereafter termed the Minnesota-R scale). The revised scale attempted to minimize idiosyncratic responding yet still leave the scale similar enough to permit a near replication of the Nelson-Henry study. The revised version used a 5-point Likert format, with responses ranging from 0 (not a problem) to 4 (extreme problem).

The SCL-90 is a 90-item self-report psychological inventory that yields nine primary symptom dimensions and three global indices of psychological distress (11, 12). The scale measures psychological symptoms at the time the instrument is administered rather than ingrained personality constructs. Respondents give a level of distress for each symptom item on a scale from 0 (not at all) to 4 (extremely). Psychometric investigations have reported the nine symptom dimensions and three global scales to be reliable, valid, and factorially invariant; norms have been collected for various groups. The designer of the SCL-90 recommended that raw scores be used in statistical analyses, but raw scores can be converted to T-scores to facilitate clinical interpretation if desired. That conversion was done.

## Results

The response rate for the total group was 60.2 percent: 62.9 percent of the residents ($n$ = 39) and 56.5 percent ($n$ = 26) of their spouses. Of these, data were missing or incomplete for one resident and five spouses; these surveys were dropped from all subsequent analyses. Of the remaining 38 residents, 30 were male and eight were female. Of these, 21 male and five female residents were married. Eighteen of the 21 male residents' spouses and three of the five female residents' spouses returned completed questionnaires. Those programs where the residents were allotted time at the meeting to complete the Minnesota-R scale had a much better response rate than the programs where the residents were asked to complete the surveys at some other time (100 percent rate of participation verses 21.7 percent rate).

The first analysis addressed whether level of stress was systematically related to overall psychological distress. The total stress scores from the Minnesota-R scale for all the residents combined and for residents after taking marital status into account were correlated with the global severity index (GSI) for the SCL-90, as this index has been found to be the best single indicator of level or depth of psychological distress (13). The GSI is the mean rating for all 90 items. Increased numbers of stressful events in the residents' lives were highly correlated with increased psychological symptoms in all instances: $r = .85$ ($df = 36$, $p < .001$) for all the residents combined, $r = .81$ ($df = 25$, $p < .001$) for the married residents, and $r = .92$ ($df = 10$, $p < .001$) for the single residents.

Dividing the residents by gender and directly comparing the score values by *t*-tests yielded significant results. The female residents identified more stressors associated with the residency program ($t = 3.72$, $df = 36$, $p < .001$) on the Minnesota-R scale and reported a higher level of psychological distress than the men ($t = 2.76$, $df = 36$, $p < .025$) on the SCL-90 GSI). Responses to the 130 items of the Minnesota-R scale were tabulated for both the male and female residents (exclusive of the eight items just for females). The female residents' mean total score on the Minnesota-R scale was nearly double that of males' (74.8 versus 41.3) and on the SCL-90 GSI three times that of the males (.74 versus .24). No significant effects were observed for marital status or for comparisons across programs (university-based versus community-based) for either the Minnesota-R scale or the SCL-90.

The next analysis involved a closer examination of the subscales of the SCL-90. Table 1 contains mean raw score values (which can range from 0 to 4.0) for the SCL-90's nine clinical scales and for the GSI for residents and spouses, categorized by gender. Mean scores for psychiatric outpatients (pooled from patients seen at four academic medical centers) and for nonpatient controls (a stratified random sample for a single county in a large eastern state), both taken from the SCL-90 manual (11), are included in Table 1 for comparison.

TABLE 1

**Mean Scores of Family Practice Residents in Four Upstate New York Residency Programs and Their Spouses and the Mean Scores of Two Normative Comparison Groups (Psychiatric Outpatients and Nonpatients) on Nine Subscales and Overall on the Symptom Checklist-90, 1986***

| Scales | New York Sample | | | | Normative Samples† | | | |
|---|---|---|---|---|---|---|---|---|
| | Residents | | Spouses | | Psychiatric Outpatients | | Nonpatients | |
| | male ($n = 30$) | female ($n = 8$) | male ($n = 3$) | female ($n = 18$) | male | female | male | female |
| Somatization | .20 | .49 | .37 | .18 | .87 | .75 | .36 | .42 |
| Psychoticism | .09 | .39 | .50 | .18 | .94 | .91 | .14 | .45 |
| Obsessive compulsive | .38 | .93 | 1.07 | .36 | 1.47 | .89 | .39 | .39 |
| Interpersonal sensitivity | .34 | .89 | 1.22 | .65 | 1.41 | .94 | .29 | .44 |
| Depression | .40 | 1.54 | 1.51 | 1.03 | 1.79 | .88 | .36 | .37 |
| Anxiety | .12 | .48 | 1.03 | .30 | 1.47 | .93 | .30 | .40 |
| Hostility | .38 | .60 | 1.50 | .68 | 1.10 | .80 | .30 | .31 |
| Phobic anxiety | .02 | .16 | .43 | .11 | .74 | .92 | .13 | .44 |
| Paranoid ideation | .22 | .65 | 1.22 | .49 | 1.16 | .70 | .34 | .25 |
| Global severity index‡ | .24 | .72 | 1.01 | .45 | 1.26 | .68 | .31 | .31 |

* The SCL-90 is a 90-item self-report inventory that measures psychological distress; respondents rate each symptom item on a scale from 0 (not at all) to 4 (extremely). The values reported here are the mean scores, by subscale; thus, the higher the score, the greater the distress.

† The values for the normative groups were taken from Derogatis (12).

‡ The GSI is the mean rating for all 90 items.

The male residents fell near the mean of the nonpatient group on each of the nine subscales and the GSI, a finding indicating that, although their lives might be stressful, these residents were not reporting heightened psychological concerns. The female residents scored somewhat higher than the nonpatient group on several scales, most notably the depression subscale, on which the female residents' mean score was over three standard deviations above the normative group score of .36. The depression score for female residents was the only one to approach a T-score cutoff of 70 (the T-value derived from the nonpatient norms was 66). To aid clinical interpretation, raw score values for tests are frequently transformed to a standardized T-distribution, wherein the mean value is 50 and the standard deviation is 10. Typically, any T-score value exceeding the mean by 2 standard deviations (or a T-score of 70) is considered a statistically and clinically significant difference. In the present studies, scores for the psychoticism, obsessive compulsive, interpersonal sensitivity, hostility, paranoid ideation, and GSI subscales were also elevated, but none of these reached the mean of the psychiatric outpatient group.

The spouses' responses to the subscales revealed increased levels of distress for both males and females. Because of the exceedingly small number of male spouse respondents ($n = 3$), these results should be interpreted cautiously if at all. The female spouses ($n = 18$) scored higher on the interpersonal sensitivity, depression, and hostility subscales than did the nonpatient comparison group and higher than the psychiatric outpatient group on the depression subscale.

Table 2 lists the 10 individual problems (from 130) on the Minnesota-R scale noted as a problem most often by all residents in the study. If the respondent chose any of the descriptors 1 to 4 (1, a

**TABLE 2**

**Percentages of 38 Family Practice Residents in Four Upstate New York Residency Programs Who Considered Each Item To Be a Problem, for the 10 Items Most Frequently Considered To Be Problems by the Residents Overall, 1986***

| Item | Percentage |
|---|---|
| Not enough time for self | 100.0 |
| Not enough leisure time | 94.7 |
| Not enough time to spend with friends/relatives | 92.1 |
| Not enough time for physical activities—sports, exercise | 92.1 |
| Problems created by inflexibility of work hours | 89.2 |
| Not enough time for study | 86.8 |
| Improvement needed in personal study habits | 86.8 |
| Not confident enough about self in medicine | 68.4 |
| Not enough money | 65.8 |
| Residents or medical people usually only people seen socially | 65.8 |

* The male residents rated each of 130 items and the female residents rated 138 items on a 5-point scale from 0 (not a problem) to 4 (extreme problem). This instrument was identical to that used by Nelson and Henry (9) in 1976 except that the original yes-no format was converted to the 5-point format. In deriving the percentages shown here, the responses 1 to 4 on the Likert scale were judged to indicate that the respondent considered the item to be a problem.

little bit of a problem; 2, a moderate problem; 3, quite a problem; 4, extreme problem), it was counted as a problem. The four most frequently chosen problems all involve time constraints that prevent residents from engaging in activities outside their work.

Table 3 lists the 10 items most frequently rated as problems in the original 1976 study by Nelson and Henry and the percentages of residents in that study and the present study who considered these items to be problems. A Spearman's Rho correlation coefficient calculated for the rank orderings indicated a fairly high degree of relationship between the two samples ($r = .74$, $p < .02$). Four of the 10 items considered most frequently to be problems by the New York residents were not judged as problems by the Minnesota residents: "I don't have enough time for myself." "I don't have enough time for physical activities—sports, exercise." "The inflexibility of my work hours creates problems for me." "I don't have enough money." The first three of these items are similar to items most frequently considered to be problems by the Minnesota residents; but the fifth item ("I don't have enough money") is markedly different from those items.

The married New York residents were concerned about not seeing friends as much as they would like, thought that their spouses felt responsible for most of the housework, reported their spouses complained about the residents' long hours and weekend and night work, and believed that their spouses needed "to feel like more of a person." The married Min-

**TABLE 3**

**Percentages of 87 Family Practice Residents in Minnesota in 1976 and 38 Family Practice Residents in Upstate New York in 1986 Who Considered Each Item To Be a Problem, for the 10 Items Most Frequently Considered To Be Problems by the Minnesota Residents***

| Items | Percentages | |
|---|---|---|
| | Minnesota | New York |
| Not enough leisure time | 69.1 | 94.7 |
| Improvement needed in personal study habits | 66.7 | 86.8 |
| Not enough time to spend with friends/relatives | 57.1 | 92.1 |
| Not enough time for study | 56.0 | 86.8 |
| Not confident enough about self in medicine | 40.5 | 68.4 |
| Reservations about being a doctor | 34.5 | 50.0 |
| Sexual drive decreased since beginning residency | 32.1 | 35.0 |
| Not sure about wanting to be a family practice physician | 23.8 | 36.8 |
| Other residents and medical people usually only people seen socially | 20.7 | 65.8 |
| Feel treated unfairly by program staff | 17.2 | 57.9 |

* The male residents rated each of 130 items and the female residents rated 138 items. In the 1976 study (9), the residents responded in a yes-no format; in the present study, they responded on a 5-point scale from 0 (not a problem) to 4 (extreme problem). In deriving the percentages shown for the New York residents, the responses 1 to 4 on the Likert scale were judged to indicate that the respondent considered the item to be a problem.

nesota residents were also concerned about these same issues. In addition, the married Minnesota residents agreed with the following items: "I am often too tired for sex." "My spouse complains of loneliness." "My spouse feels he/she must compete with my work." A Spearman's Rho was calculated for the top 20 items endorsed by each group of married residents, and there was a strong correlation between the two sets of rankings ($r = .68$, $p < .05$).

The final analysis concerned the 10 therapeutic interventions: residents' support group; spouses' support group; couples' support group; male residents' support group; female residents' support group; three-day weekend workshop on stress management; a stress management workshop for two hours on one day per week for eight to 10 weeks; self-applied stress management programs such as tapes and reading materials; relaxation therapy such as classes in biofeedback, relaxation exercises, and/or meditation; and professional counseling for individuals and/or couples. The respondents were asked to state yes or no as to whether the programs should be available and whether they would participate. They were then asked to rank-order their top three choices of interventions in which they would participate. Of these 10 possibilities, 40.6 percent of the participants ranked the residents' support group and relaxation therapy as their top two choices, and 30.5 percent ranked counseling for individuals and/or couples as their third option.

## Discussion

In the study reported here, the authors attempted to identify the sources and effect of stress that family practice residents experience. One consistent finding was that the female residents reported more psychological distress than the male residents. Even though the women's mean scores were not clinically significant, there was a sizable difference between the scores of the female and male residents. It is possible that this finding occurred in part because, for example, the females may have responded more openly or may have been more sensitive of their feelings. The relative absence of female role models demonstrating effective coping behaviors in medicine may also account for some of these differences.

The spouses as a group showed more distress on each scale than did the residents. Since spouses feel they have to carry more than their share of family responsibilities when their partner is a resident, perhaps educators should focus more attention on reducing stress among spouses as a way to reduce stress for residents.

When the percentages of residents who considered each item a problem were compared between the present sample and the Minnesota sample, the percentages were much higher for the present sample for every item except two ("We have problems deciding about having children" [Minnesota, 28.1 percent agreed; New York, 22.2 percent agreed] and "My spouse and I are not able to talk about some of our problems" [Minnesota, 24.6 percent agreed; New York, 22.2 percent agreed]. This increase likely occurred because the 5-point response scale of the present instrument was more sensitive to reporting problems; that is, respondents who might have answered "no" in a yes-no format might have answered "a little bit of a problem" or "moderate problem" in the Likert format. Alternatively, the increase may indicate a true increase in stress over time (1976 verses 1986). Replication of the present findings at other programs would help clarify the significance of the higher stress reported by the present sample.

Consistent with the authors' experience in working with family practice residents was the finding that the respondents felt a need for counseling services and support groups for residents and spouses. Even though the residents and spouses in the present sample did not score in the range indicating clinical illness on the SCL-90 and they appeared to be handling stress well, they felt a need for outside intervention. A similar conclusion was drawn by Tokarz and colleagues (2), who reported that house officers and their spouses felt a need for low-cost counseling services and support groups. In the past, medical students have had such counseling and support groups, but only recently has such support been recognized as essential for residents and their spouses. Weinstein (14) reported the formation of a committee on well-being for house staff members that provides counseling and serves as an ombudsman for them.

Focusing on understanding the sources of stress in a family practice residency could lead to more effective coping strategies by the residents or even amelioration of the stressful factors. With proper support, guidance, and leadership, residency programs could provide better preparation for the education and the mental and physical well-being of family physicians. These highly trained physicians could, in turn, better provide for the mental and physical well-being of the rest of the population.

The present study has limitations that should be acknowledged. These limitations concern the varied response rates across the four programs (21.7 to 100 percent), the small sample size for some groups (male spouses, for example), uneven gender distribution (almost four times more men than women), and the absence of more objective data to corroborate physical and emotional effects of stress (such as types of illness experienced, type and amount of care sought for emotional problems, or laboratory or biochemical measures). Follow-up research with larger samples and more objective data is needed. Larger sample sizes would permit measurement and comparison of effects of stress for other residency specialties as well. All such research will lack great value without field trials of preventive and/or remedial programs, and researchers should direct more of their attention to these programs.

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# A Management Skills Workshop for Chief Residents

*Neal Whitman, Ed.D.*

**Abstract**—A needs assessment was used to plan a national workshop on management skills for chief residents. Of replies from 1,256 residency programs, 50 percent of the respondents reported a high likelihood of attending such a workshop. The three skills that the respondents considered should be given high priority in such a workshop were giving feedback, delegating duties, and building teamwork. Based on these responses, the author designed and conducted a two-day workshop in June 1987 that was attended by 180 chief residents from 138 programs in 21 specialties from 36 states. Each skill was taught by presenting a lecture and a small-group exercise to apply the skill; these small groups were led by trained faculty members. The participants rated the workshop as 4.21 (on a 5-point scale in which 5 = very helpful). The workshop will be offered annually.

Becoming a chief resident is an honor that is the culmination of hard work and demonstration of outstanding personal traits. However, the position requires managerial skills that residents have had little or no exposure to in medical school or residency training (1). Moreover, there are few programs available to teach management skills to residents once they are appointed chief resident. Some efforts are made at the annual meetings of program directors. For example, at the 1987 Annual Meeting of the Association of Program Directors in Internal Medicine, workshops for chief residents were offered on effective feedback and on the problem resident. In addition, some residency programs offer training to chief residents in the same specialty. For example, the Department of Psychiatry at the Albert Einstein College of Medicine of Yeshiva University conducts an annual workshop for psychiatry chief residents. A national workshop for chief residents in all specialties was conducted by the New York University School of Continuing Education Management in 1984 and 1985 but was canceled in 1986 due to low enrollment.

Based on the reported need to train chief residents to become more effective managers (2) but in the absence of a reported study of specific needs, the author conducted a needs assessment survey of residency directors and chief residents. According to Davis (3) a needs assessment serves at least four purposes: it gives a place to begin; it provides direction; it answers the question "why?"; and it authorizes continuation or gives permission to stop. The present author's needs assessment, reported here, fulfilled these purposes and authorized continuation; that is, it identified needs and justified developing a program to meet those needs.

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## Needs Assessment

In January 1987 a questionnaire was sent to the 5,746 U.S. residency directors on a mailing list purchased from the American Medical Association. They were requested to complete the survey jointly with a chief resident. The survey asked respondents to rate the helpfulness for chief residents of 10 management skills and to identify which three of these skills should be given high priority in a workshop. They were also asked to suggest their own topics for such a workshop. In addition, the directors were asked to indicate the likelihood that they would send a chief resident to a national workshop and what they considered to be a fair tuition for a two-day program.

From this one mailing, 1,256 questionnaires were returned, a 22 percent response rate. Fifty percent of the respondents rated the likelihood that they would send a chief resident to a two-day management course for chief residents as likely or very likely (on a scale that ranged from 1 = not likely to 5 = very likely). The mean suggested tuition was $147.

Their ratings of the 10 suggested management skills are shown in Table 1 in rank order. A difference of .15 between any two means was statistically significant at the .01 level (Wilcoxon's matched pairs with the Bonferroni inequality). Analysis using a Manzel-Hansel chi-square showed that there was a statistically significant relationship between likeliness to attend and the mean rating or helpfulness for each skill except that of building teamwork in the residency program, which was rated very high for all levels of likeliness to attend.

Also shown in Table 1 is the percentage of respondents who identified each skill as a high priority for a two-day course. Not surprisingly, the three skills rated as most helpful also were identified by the most respondents as the top three priorities: giving feedback, delegating duties, and building teamwork. Again, statistical analysis was used to determine whether there was a relationship between likeliness to attend and the priority of each skill. Analysis using a Pearson's chi-square showed a significant relationship for only two of the 10 skills: delegating duties ($P \leq .01$) and writing letters and memos ($P \leq .002$). In general, while the respondents who reported they were less likely to attend rated the 10 skills as less helpful than did the other respondents, there was much agreement among all respondents over which skills should be given priority in a workshop.

With a 22 percent response rate, the

**TABLE 1**

**Mean Ratings of Helpfulness of 10 Management Skills and the Percentage Identifying Each Skill as a High Priority of 1,256 Residency Directors and/or Chief Residents, 1987***

| Skills | Mean† | Percentage Identifying Skill as High Priority‡ |
|---|---|---|
| Giving feedback | 4.36 | 42 |
| Delegating duties | 4.35 | 49 |
| Building teamwork | 4.35 | 52 |
| Managing time | 4.13 | 36 |
| Making presentations | 3.94 | 25 |
| Making rounds | 3.91 | 28 |
| Coping with stress | 3.88 | 23 |
| Teaching at the bedside | 3.69 | 17 |
| Writing memos | 3.54 | 9 |
| Managing meetings | 3.30 | 11 |

* The questionnaire was mailed to the 5,746 U.S. residency directors on a list of directors maintained by the American Medical Association. The respondents were told to complete the questionnaire jointly with a chief resident.

† Rated on a 5-point scale (5 = very helpful, 1 = not helpful).

‡ Respondents were asked to choose three of the 10 skills as high-priority skills to be taught in a workshop on management skills for chief residents.

results had to be used carefully. One concern was that those who responded were more likely to attend a management workshop than those who did not respond. Since there was a relationship between likeliness to attend and helpfulness ratings for nine of the 10 skills, the helpfulness rating of nonrespondents could be expected to be low based on the assumption that the nonrespondents would be unlikely to attend. On the other hand, it was useful to know that the respondents assigned similar priorities to the skills regardless of likeliness to attend. Based on these results, the author felt confident in selecting giving feedback, delegating duties, and building teamwork as the skills to be taught in a two-day course. The author had not anticipated the importance of team-building to the respondents and, without the needs assessment data, would not have given it importance in the course.

A second concern was that the author did not ask respondents to indicate whether the survey was completed jointly by the residency director and chief resident (as requested) or singly by only one of them. Such information could have been used to gauge the residency directors' and the chief residents' enthusiasm for a workshop.

As mentioned previously, respondents were asked to recommend skills to be taught in the workshop. Because many respondents recommended "conflict resolution," it was added to the workshop curriculum.

## Workshop

The two-day workshop, entitled "Chief Residents as Managers," was sponsored by the University of Utah Medical Center in June 1987 and held in a hotel in Salt Lake City. The 180 participants were from 138 residency programs in 21 specialties from 36 states. The most represented specialties were internal medicine, 48; family medicine, 30; and surgery, 22. The stated conference goal was "to help residents become more familiar and comfortable with key principles of middle management so they will become more effective as chief or senior residents." The eight workshop objectives were that participants, as a result of the course, could more effectively identify their own strengths and weaknesses as managers, practice time management strategies, delegate work and give feedback, motivate others, cope with stress, resolve conflict in their programs, conduct clinical teaching, and build teamwork in their programs.

To achieve the first objective, the participants completed a "life orientation" survey developed by Atkins (4) to describe commonly preferred management styles. The survey is self-scoring and categorizes individuals into one (or a combination) of four management styles.

People who prefer a "supporting-giving" style (chosen by 37 percent of the participants) like to be seen as loyal team members and put emphasis on helping others. The "conserving-holding" style (chosen by 27 percent) describes those who like to be seen as reasonable and are systematic in their approach to people and problems. The "controlling-taking" style (chosen by 24 percent) describes people who like to be seen as competent and prefer to be in charge. People who prefer the "adapting-dealing" style (chosen by 13 percent) like to be seen as friendly and put emphasis on getting along with others and being flexible. At the participants' request, the survey results were analyzed overnight by specialty, and, as reported on the second day, there were no differences by specialty. Their high interest in this survey was welcomed by the author, because the participants were asked to use their survey results throughout the workshop.

The basic method for the course was presentation of information on a management skill (for example, time management) in 45 minutes followed by a 60-minute small-group exercise on applying the skill. The participants were assigned by specialty to the same group with the same faculty leader for two days. Faculty leaders from the author's medical school were trained to conduct specific activities for each small-group exercise. For example, in the small-group exercise on time management, each participant completed a personal time management action plan, and then all discussed the individual plans.

Medical school faculty members rather than management experts were chosen to lead the small-group discussions. Since the purpose of the group exercises was to apply basic management principles already explained in the preceding lecture and to discuss the realities of residency training, group leaders familiar with residency programs were preferred. However, the faculty members were chosen on the basis of their administrative experience. For example, of the 10 group leaders, one was a department chairman, one was a vice chairman, and two were former chief residents; and a non-M.D. was the host medical center's director of graduate medical education.

In the workshop orientation, the willingness of participants to apply the skills and work in their groups was emphasized as the key to the success of the workshop. Full attendance at small groups was maintained until the last group activity on the second day; attendance at that final group session was 75 percent; and the group leaders reported that most absentees had left because of their travel plans.

## Evaluation

The participants were surveyed at the end of the workshop. A 5-point scale (5 = very helpful, 1 = not helpful) was used to rate each lecture and small-group exercise; the results are shown on Table 2. The mean rating for the overall program was 4.21. No participant rated the overall

**TABLE 2**

**Mean Ratings and Number of 180 Participants Rating Each of Six Workshop Components and the Program Overall Following a Workshop on Management Skills for Chief Residents, Sponsored by the University of Utah Medical Center, June, 1987***

| Activities | Mean | No. |
|---|---|---|
| Component 1 | | |
| Lecture: Developing a game plan | 4.35 | 121 |
| Lecture: Managing time effectively | 4.42 | 117 |
| Small-group exercise | 3.79 | 118 |
| Component 2 | | |
| Lecture: Delegating work and giving feedback | 4.23 | 120 |
| Small-group exercise | 3.83 | 120 |
| Component 3 | | |
| Lecture: Motivating others | 3.95 | 119 |
| Lecture: Coping with stress | 3.58 | 121 |
| Small-group exercise | 3.67 | 120 |
| Component 4 | | |
| Lecture: Resolving conflict | 3.91 | 121 |
| Small-group exercise | 3.63 | 120 |
| Component 5 | | |
| Lecture: Clinical teaching | 3.69 | 121 |
| Small-group exercise | 3.65 | 114 |
| Component 6 | | |
| Lecture: Team building | 3.83 | 106 |
| Overall program | 4.21 | 117 |

* Activities were rated on a 5-point scale ranging from 5 = very helpful to 1 = not helpful. A total of 180 chief residents participated, but not all completed the evaluation questionnaire or answered all questions.

program as 1 or 2, and only 14 rated it as 3.

The participants and the small-group leaders recommended that the activities planned for small-group exercises be more flexible. It was suggested that group leaders begin by asking participants to comment on the lecture and then to use the planned exercises after the participants' concerns had been addressed.

Ongoing feedback from the participants during the workshop was largely positive, and a group consensus was informally formulated that the participants would recommend the conference to their successors.

## Conclusion

Based on a needs assessment survey, the author planned a two-day workshop addressing the residency directors' and chief residents' perceived needs. The evaluation results suggested that the participants had high satisfaction with the workshop, and the author plans to improve the workshop and offer it annually.

Since many chief residents pursue careers that require effective management, course work in management skills might be helpful. Perhaps one course should be offered just prior to the chief residency year and another course at the end of the year. The purpose of this second course would be to consolidate management skills practiced during the year and introduce additional skills.

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dents have represented minority groups (such as those defined by the Association of American Medical Colleges), rural residents, veterans, and educationally disadvantaged individuals. Some of these students were considered high-risk participants because of the large improvements needed in their academic records. In the supportive environment of the program, the students worked to earn better grades in college, receive higher MCAT scores, and develop appropriate skills for professional school. Of those admitted to professional school, 87 percent had graduated from or were in school.

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# Career Preferences, Career Decision-Making, And Orientation Toward Medicine Among Third-Year Students

*Linda Z. Nieman, Ph.D., Donald Holbert, Ph.D., and C. Christopher Bremer, M.D.*

Previous studies regarding the selection of family medicine (FM) as a career focused upon sociodemographic factors, personality factors, attitudes, and clinical experiences that influence decisions (1–3). Seeking to overcome the lack of a theoretical framework in such studies, the present authors in 1984 conducted research (4) that applied the theories of Janis and Mann (5), Funkenstein (6), and Matteson and Smith (7) in an investigation of career decision-making among first-year medical students. The purpose of the present study was to use theories found useful in that earlier study of first-year students to measure and describe career decision-making among third-year students.

## Materials and Methods

The population sample consisted of 429 third-year medical students at North Carolina's four medical schools: East Carolina University School of Medicine, Bowman Gray School of Medicine of Wake Forest University, Duke University School of Medicine, and the University of North Carolina at Chapel Hill School of Medicine.

A career preference questionnaire, similar to the one used to examine the decision-making of first-year medical students (4), was administered late in April 1985. The authors sought to answer the following questions: Was there a difference in orientation toward medicine (that is, orientation toward research, prevention, or patient care) of third-year medical students preferring FM and those preferring other specialties? Did FM students differ from others in their stage of decision-making? When, in comparison with other students, did FM students first prefer their specialty, and how consistent was that preference? Did students who prefer FM differ from other students in the thoroughness and logic of their career decision?

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**Results and Discussion**

The total number of respondents was 251 (59 percent). The response rates for individual schools were: Bowman Gray, 51 percent; Duke, 69 percent; East Carolina, 92 percent; and North Carolina, 46 percent. Sixty-nine percent of the respondents were male, a percentage similar to that of all 1986 graduates, as reported on the 1986 graduation questionnaire of the Association of American Medical Colleges.

The students' basic orientation toward medicine was identified as "bioscientific" (desired primarily to be a scientist who helps people using a high degree of scientific knowledge), "biosocial" (desired primarily to work directly with people, being of service to them and treating their illnesses using science pragmatically), and "mixed." Second, they were classified as preferring FM or preferring other areas. And, third, they were also classified into five phases of decision-making: phase 1—having always been sure of their career preferences; phase 2—recently confused by new information; phase 3—seeking new information about options; phase 4—narrowing down the final few choices; and phase 5—confident that their choice would not change.

A total of 38 students (15 percent) preferred FM. Orientation toward medicine was strongly related to specialty preference (chi-square = 11.6, df = 4, $p = .02$). The biosocial orientation toward medicine was more common among those who preferred FM than among those who preferred other specialties. Specialty choice was not associated with phase of decision-making (chi-square = 5.3, df = 4, $p = .26$). The biggest difference between the FM group and the non-FM group with respect to phase of decision-making was that 26 percent of the FM group was at phase 1, whereas only 15 percent of the non-FM group was at phase 1.

Two analyses were performed regarding the time at which preferences were made and the consistency of those preferences; the findings are presented in Table 1. Those students preferring FM tended to have first considered their specialty earlier than those preferring other specialties and had maintained their specialty preference from an earlier stage in medical school than had their classmates who preferred other specialties.

The vigilance or thoroughness with which the students conducted their decision-making was studied by conducting three analyses, namely, the association of (*a*) the number of information sources consulted when making career decisions with the degree of commit-

**TABLE 1**

**Percentages of 251 Third-Year Students at the Four North Carolina Medical Schools Who Stated When They Had First Considered Their Preferred Specialty and How Long Their Preference Had Persisted During Medical School, by Specialty Preference, 1985**

| Factors | Preferences* Family Medicine ($n = 38$) | Other Specialties ($n = 213$) |
|---|---|---|
| Specialty first considered | | |
| In high school | 31 | 10 |
| In college | 22 | 21 |
| In graduate or medical school | 47 | 69 |
| Specialty preferred since | | |
| Medical school year 1 | 61 | 36 |
| Medical school year 2 | 13 | 23 |
| Medical school year 3 | 26 | 41 |

*Summary statistics for the differences were: specialty first considered (chi-square = 13.9, df = 2, $p = .01$) and persistence of preference (chi-square = 8.0, df = 2, $p = .02$).

ment to the preferred specialty, (*b*) the number of specialties ruled out with the degree of commitment to the preferred specialty, and (*c*) the number of information sources consulted with the number of specialties ruled out. These analyses were conducted separately for the FM group and the non-FM group. Both the number of information sources consulted and the number of specialties ruled out were classified as zero, one, two, three, four, or at least five. Degree of commitment was classified as low (less than 75 percent committed) or high (at least 75 percent committed). The degree of association was evaluated in each case using a chi-square contingency table analysis. For non-FM students, the results showed that the greater the number of sources consulted and the greater the number of specialties ruled out, the more committed the students were to their preferred specialty. This finding could suggest that the non-FM students exhibited more vigilance in their decision-making than did their classmates who prefer FM. Although no associations were statistically significant for the FM group, the same tendencies toward positive associations were present in the data.

Differences in orientation toward medicine were less pronounced among these third-year students than among the first-year students studied previously (4). This finding may reflect the fact that research is emphasized less during the clinical years than during the preclinical years. It also may reflect the current small percentage of students who eventually select basic science, research-oriented careers.

As noted above, there were no differences in phases of decision-making between third-year medical students preferring FM and those preferring other specialties. A greater percentage of FM students than non-FM students apparently do not pass through the sequential phases of decision-making. Rather, they apparently move directly from phase 1 (never having considered alternatives) to phase 5 (being sure they will not alter their decision). This finding reflects Janis and Mann's (5) explanation that phase 1 and phase 5 are alike for less vigilant decision-makers.

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# DATAGRAM

## Results of the NRMP for 1988

The number of U.S. seniors who enrolled in the National Resident Matching Program (NRMP) in 1988 increased by 47 from a year ago (1) but was 403 less than in 1985 (2). The number who subsequently withdrew increased by 14 over 1987 (Table 1), but the number of active applicants increased by 33. The number who were unmatched increased by 133.

The total number of U.S. and Canadian students (U.S. seniors, "fifth pathway" students, physician candidates [earlier U.S. graduates who are seeking a position in graduate medical education], and osteopathic and Canadian graduates but excluding U.S. foreign medical graduates [FMGs]) who applied to the match this year increased by 319. The number of "fifth pathway" applicants decreased from 210 to 163; 128 participated in the match, and 84 percent were successful. The number of graduates of osteopathic schools who initially applied to the match increased by 31 percentage points to 1,158, over a fourfold increase since 1983; 68 percent were matched. The number of physician applicants increased by 2 percentage points, and 46 percent were successful in the match.

The number of U.S. citizen-FMGs who applied decreased by 66 to 1,535, only slightly more than half of the number in 1984; 49 percent of the active participants successfully matched in 1988, an increase of 6 percentage points over 1987. The number of alien FMGs decreased by 8 percent to 4,089, and the percentage matched increased by 10 percentage points to 44 percent.

The number of positions offered for the first postgraduate year (PGY-1) increased by 466; 252 more were offered in the generalist* specialties than in 1987 (Table 2), a decrease of 0.3 percentage points to 65.4 percent of all positions. The ratio of positions per initially-enrolled applicant was 0.8, an increase of 0.1; that of positions per all U.S. senior, other U.S.-Canadian citizen applicant, and U.S. FMG was 0.9; and that per U.S. senior was 1.2. The ratios for active applicants in the match were, respectively, 1.0, 1.1, and 1.3.

The overall filling of PGY-1 positions decreased by 1.5 percentage points and the filling of positions by U.S. seniors by 2.2 percentage points. The number of U.S. seniors who matched in family practice decreased by 234. Psychiatry attracted 70 more seniors than last year. The most competitive programs were again in emergency medicine, obstetrics/gynecology, orthopedic surgery, and radiology. The participation of programs and positions in psychiatry, orthopedic surgery, emergency medicine, and diagnostic radiology increased considerably. The low number of positions in neurological surgery, otolaryngology, and urology is attributable to the withdrawal of many programs in order to participate in non-NRMP matches. Only a few programs in plastic surgery again participated in the match. The distribution of matched U.S. seniors among types of programs increased in internal medicine (preliminary and primary care tracks), obstetrics/gynecology, psychiatry, and orthopedic surgery, but the percentage of the class entering family practice and general surgery decreased.

(The total number of applicants matched for internal medicine positions in 1987 was 5,827 rather than 5,327 as listed a year ago [1].)

An increased number of advanced programs for students (PGY-2 positions) were offered in the match this year; 282 programs offered 1,359 positions, 67 percent of which were filled by 913 U.S. seniors and 75 percent by a total of 1,012 applicants. A total of 111 programs in diagnostic radiology offered 407 PGY-2 positions, of which 77 percent were filled with

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*"Generalist" specialties are defined as family practice, internal medicine, obstetrics/gynecology, and pediatrics.

**TABLE 1**

**Participation in the National Resident Matching Program in 1988**

| Category | U. S. Senior Students |  | Other U.S. and Canadian Students* |  | U.S. Foreign Graduates |  | Foreign-Born Foreign Graduates |  | Total Applicants |  |
|---|---|---|---|---|---|---|---|---|---|---|
|  | No. | Percent | No. | Percent | No. | Percent | No. | Percent | No. | Percent |
| Total applicants | 15,776 | 100.0 | 3,368 | 100.0 | 1,535 | 100.0 | 4,089 | 100.0 | 24,768 | 100.0 |
| Withdrew | 1,277 | 8.1 | 1,616 | 48.0 | 515 | 33.6 | 1,552 | 38.0 | 4,960 | 20.0 |
| Active participants | 14,499 | 91.9 | 1,752 | 52.0 | 1,020 | 66.4 | 2.537 | 62.0 | 19,808 | 80.0 |
| Matched | 13,496 | 93.1 | 1,004 | 57.3 | 500 | 49.0 | 1,119 | 44.1 | 16,119 | 81.4 |
| Unmatched | 1,003 | 6.9 | 748 | 42.7 | 520 | 51.0 | 1,418 | 55.9 | 3,689 | 18.6 |
| Total | 14,499 | 100.0 | 1,752 | 100.0 | 1,020 | 100.0 | 2.537 | 100.0 | 19,808 | 100.0 |

* Other U.S. and Canadian students consist of graduates from U.S. osteopathic schools and Canadian medical schools; physician candidates, that is, earlier U.S. graduates seeking a position in graduate medical education; "fifth pathway" students, who are U.S. nationals who completed course requirements for a medical degree abroad followed by a year of clinical training in a U.S. hospital under medical school sponsorship.

U.S. senior students and 14 percent with physician applicants for a total filling of 91 percent. A total of 109 programs in anesthesiology offered 723 positions, of which 64 were filled with U.S. senior students and 3 percent with other applicants for a total filling of 67 percent. Ninety percent of the senior students matched to PGY-2 positions were also matched to PGY-1 positions in the match.

In the 1988 match, 776 individuals participated in 388 couples; 91 percent of these U.S. students were successfully matched.

Several specialty matches for physician candidates were carried out by the NRMP in 1987. In the fall, 24 programs offered 48 positions in colon and rectal surgery; 94 percent were filled by 57 percent of the applicants. Late in the fall, 20 programs in emergency medicine offered 119 positions; 97 percent of them were filled by 46 percent of the physician applicants. In the specialty match for dermatology last fall, there were 515 applicants for 206 positions. A total of 205 (40 percent) physicians were matched to fill 99 percent of the positions. In June 1987, 54 programs offered 77 positions in thoracic surgery. Of them, 86 percent were filled with 66 applicants (62 percent). In the fall, 36 vascular surgery programs offered 44 positions, of which 98 percent were filled with 43 (43 percent) of the applicants.

The Medical Specialties Matching Program (MSMP) took place last June for fellowships in all of the subspecialties of internal medicine for positions to begin in July 1988. The number of participating programs was 1,024 in 16 subspecialties that offered 2,240 positions, Seventy-seven percent of these positions were filled by 1,730 applicants, who represented 72.2 percent of the active applicants.

A new Rank Order List Input and Confirmation System was used this year. Under this system, the medical schools and teaching hospitals entered and confirmed their rank order lists at some 500 sites. Access to an entry site was not available for 2,711 applicants; they sent NRMP paper rank order lists.

Data that describe the trends in numbers of positions offered and filled by U.S. seniors and other applicants during the past several years

## TABLE 2

### Postgraduate-Year-One Positions Offered and Filled by Specialty and Type of Applicants in the NRMP in 1988

| Specialty | Positions Offered | | Applicants Matched | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | U.S. Senior Students | | | Other U.S. and Canadian Applicants‡ | | | Foreign-Born Foreign Graduates | | | Total Applicants | | | |
| | No. | Percent* | No. | Percent | | No. | Percent | | No. | Percent | | No. | Percent | | |
| | | | | * | † | | * | † | | * | † | | * | † | |
| Family practice | 2,412 | 12.4 | 1,494 | 11.1 | 61.9 | 230 | 15.3 | 9.5 | 43 | 3.8 | 1.8 | 1,767 | 11.0 | 73.3 | |
| Internal medicine | 7,272 | 37.3 | 4,846 | 35.9 | 66.6 | 562 | 37.4 | 7.7 | 652 | 58.3 | 9.0 | 6,060 | 37.6 | 83.3 | |
| Pediatrics | 2,036 | 10.4 | 1,313 | 9.7 | 64.5 | 162 | 10.8 | 8.0 | 184 | 16.4 | 9.0 | 1,659 | 10.3 | 81.5 | |
| Obstetrics/gynecology | 1,043 | 5.3 | 903 | 6.7 | 86.6 | 68 | 4.5 | 6.5 | 10 | 0.9 | 1.0 | 981 | 6.1 | 94.1 | |
| Psychiatry | 1,097 | 5.6 | 745 | 5.5 | 67.9 | 109 | 7.2 | 9.9 | 78 | 7.0 | 7.1 | 932 | 5.8 | 85.0 | |
| Medical specialties | 69 | 0.4 | 48 | 0.4 | 69.6 | 4 | 0.3 | 5.8 | 6 | 0.5 | 8.7 | 58 | 0.4 | 84.1 | |
| Dermatology | 7 | 0.0 | 6 | 0.0 | 85.7 | 0 | 0.0 | — | 1 | 0.1 | — | 7 | 0.0 | 100.0 | |
| Neurology | 42 | 0.2 | 24 | 0.2 | 57.1 | 3 | 0.2 | 7.1 | 5 | 0.4 | 11.9 | 32 | 0.2 | 76.2 | |
| Ophthalmology | 20 | 0.1 | 18 | 0.1 | 90.0 | 1 | 0.1 | — | 0 | 0.0 | — | 19 | 0.1 | 95.0 | |
| General surgery | 2,270 | 11.6 | 1,647 | 12.2 | 72.6 | 140 | 9.3 | 6.2 | 48 | 4.3 | 2.1 | 1,835 | 11.4 | 80.8 | |
| Surgical specialties | 601 | 3.1 | 538 | 4.0 | 89.5 | 41 | 2.7 | 6.8 | 0 | 0.0 | 0.0 | 579 | 3.6 | 96.3 | |
| Neurosurgery | 30 | 0.2 | 24 | 0.2 | 80.0 | 0 | 0.0 | 0.0 | 0 | 0.0 | — | 24 | 0.1 | 80.0 | |
| Orthopedics | 439 | 2.2 | 402 | 3.0 | 91.6 | 36 | 2.4 | 8.2 | 0 | 0.0 | — | 438 | 2.7 | 99.8 | |
| Otolaryngology | 49 | 0.3 | 42 | 0.3 | 85.7 | 1 | 0.1 | 2.0 | 0 | 0.0 | — | 43 | 0.3 | 87.8 | |
| Urology | 77 | 0.4 | 64 | 0.5 | 83.1 | 4 | 0.3 | 5.2 | 0 | 0.0 | — | 68 | 0.4 | 88.3 | |
| Plastic surgery | 6 | 0.0 | 6 | 0.0 | 100.0 | 0 | 0.0 | — | 0 | 0.0 | — | 6 | 0.0 | 100.0 | |
| Support Specialties | 1,449 | 7.4 | 1,017 | 7.5 | 70.2 | 136 | 9.0 | 9.3 | 49 | 4.4 | 3.4 | 1,202 | 7.5 | 83.0 | |
| Anesthesiology | 270 | 1.4 | 219 | 1.6 | 81.1 | 8 | 0.5 | 3.0 | 8 | 0.7 | 3.0 | 235 | 1.5 | 87.0 | |
| Emergency medicine | 326 | 1.7 | 278 | 2.1 | 85.3 | 44 | 2.9 | 13.5 | 1 | 0.1 | 0.3 | 323 | 2.0 | 99.1 | |
| Pathology | 443 | 2.3 | 184 | 1.4 | 41.5 | 31 | 2.1 | 7.0 | 37 | 3.3 | 8.4 | 252 | 1.6 | 56.9 | |
| Physical medicine | 78 | 0.4 | 73 | 0.5 | 93.6 | 2 | 0.1 | 2.6 | 1 | 0.1 | 1.3 | 76 | 0.5 | 97.4 | |
| Preventive medicine | 7 | 0.0 | 4 | 0.0 | 57.1 | 0 | 0.0 | — | 1 | 0.1 | 14.3 | 5 | 0.0 | 71.4 | |
| Diagnostic radiology | 313 | 1.6 | 252 | 1.9 | 80.5 | 50 | 3.3 | 16.0 | 1 | 0.1 | 0.3 | 303 | 1.9 | 96.8 | |
| Therapeutic radiology | 9 | 0.0 | 7 | 0.1 | 77.8 | 0 | 0.0 | — | 0 | 0.0 | 0.0 | 7 | 0.0 | 77.8 | |
| Nuclear medicine | 3 | 0.0 | 0 | 0.0 | 0.0 | 1 | 0.1 | 33.3 | 0 | 0.0 | 0.0 | 1 | 0.0 | 33.3 | |
| Transitional | 1,264 | 6.5 | 945 | 7.0 | 74.8 | 52 | 3.5 | 4.1 | 49 | 4.4 | 3.9 | 1,046 | 6.5 | 82.8 | |
| Total | 19,513 | 100.0 | 13,496 | 100.0 | 69.2 | 1,504 | 100.0 | 7.7 | 1,119 | 100.0 | 5.7 | 16,119 | 100.0 | 82.6 | |

* Percent distributions of positions offered and filled among specialties (percentages may not add to 100 due to rounding).

† Percent of positions offered in specialty that were filled by applicants.

‡ This category consists of those students listed in the footnote to Table 1 plus U.S. foreign medical graduates.

are included in the NRMP's annual directories (3).

JOHN S. GRAETTINGER, MD., *executive vice president, National Resident Matching Program, and professor of medicine (emeritus), Rush Medical College, Chicago.*

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# JOURNAL OF Medical Education

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# Survey of Women Physicians on Issues Relating to Pregnancy During a Medical Career

*Sara Sinal, M.D., Patricia Weavil, M.D., and Martha G. Camp, Ph.D.*

**Abstract**—Many women in medical training want to combine a family life and a career. Of major interest to these women is determining the most desirable time for pregnancy during their medical education and career. The results of a study on women physicians' timing of pregnancy are reported. A 53 percent response rate was obtained in a randomized national survey of women physicians who had completed residency training and were less than 50 years of age. Their first pregnancies (of which 77 percent were planned) occurred as follows: prior to medical school, 4 percent; during medical school, 7 percent; in first year as house officer, 11 percent; in other residency year, 32 percent; in fellowship year(s), 13 percent; in practice, 28 percent, on leave or other, 5 percent. Seventy percent of the respondents considered "after completion of residency" to be the best time to become pregnant. Sixty percent of the respondents' maternity leaves were six weeks or less in duration. Seventeen percent required some medical leave before delivery, although only 5 percent required more than eight weeks of medical leave. Only a third reported that their training or work sites had maternity leave policies. Ninety-one percent of the respondents reported satisfaction in their careers.

The proportion of U.S. medical school students who are women increased dramatically, from 8 percent to 32 percent, between 1965 and 1985 (1). Twenty-six percent of the training slots in residency programs are filled by women. Seven years ago one-third of the specialties had no women in training, but by 1985 only vascular surgery remained as an all-male residency program.

Many of the women in medicine want to combine family life with a career. A common concern of women medical students is the timing of pregnancies (2). They are concerned that pregnancy will cause significant interruptions in their careers and that a demanding career will prevent optimal nurturing of their children. Women also worry that delaying childbearing may result in infertility or pregnancy complications (3).

A 1984 American Medical Association (AMA) survey (4) of 400 women physicians found that almost 50 percent had had their first child during training and 25 percent had had a second child during training. The present study expands on the AMA study by obtaining information on pregnancy timing.

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The work reported here was supported in part by a grant from the North Carolina United Way and the Bowman Gray School of Medicine.

Dr. Sinal is assistant professor of pediatrics, Dr. Weavil is instructor of pediatrics and director of the Physician Assistant Program, and Dr. Camp is associate professor of medical education, all at Bowman Gray School of Medicine of Wake Forest University, Winston-Salem, North Carolina.

## Methods

The group surveyed was a national sample of 904 women physicians who had completed residency training, were less than 50 years of age, and were listed in the American Medical Association's Physician Masterfile. An initial sample of 9,000 names, randomized with respect to geographic area and age, was purchased from an AMA-approved vendor. A 10 percent sample was determined to be sufficient to allow statistically correct results at the 95 percent confidence level. A sample of 933 names was randomly selected by computer.

In the fall of 1985, those in the sample were mailed a questionnaire accompanied by a letter explaining the study. The questionnaire asked for basic demographic data and information about board certification, income, specialty choice, and practice patterns. The second part of the questionnaire concerned the timing of the first pregnancy, maternity leaves, and support systems during pregnancy and the child's infancy. The third section was concerned with satisfaction in career and in family and personal life. A final section asked the women to comment on or make recommendations regarding pregnancy timing during a medical career.

The authors conducted a pilot study of the questionnaire in early 1985 by administering it to 40 women physicians from the Winston-Salem, North Carolina, area. The questionnaire asked the women about all their pregnancies, and the results revealed that most of the desired information could be obtained by studying first pregnancies only.

The respondents' responses to the full-scale survey reported here were analyzed by use of the chi-square statistic.

## Results

Of an initial mailing of 933 questionnaires, 29 were returned as undeliverable, leaving a sample size of 904. This initial mailing plus two follow-up mailings to nonrespondents resulted in a response rate of 53 percent. Of the 480 questionnaires returned, 474 were usable.

### BACKGROUND DATA

Of the 474 respondents, 64 percent (303) had children of their own (that is, exclusive of adopted children), averaging 1.4 children; 36 percent (171) had no children of their own. Eleven of these 171 women had step children. The respondents ranged in age from 29 to 49 years, 35 percent were aged 29 to 34 years, 32 percent were 35 to 39 years, 20 percent were 40 to 44 years, and 13 percent were 45 to 49 years. The median age of all respondents was 38 years; women with children, 40 years; and women without children, 36 years. Seventy-two percent of all respondents were board-certified, while 74 percent of those with children and 70 percent of those without children were board-certified.

The respondents' incomes were rounded to the nearest thousand. The median personal income was $60,000, and median family income was $98,000 for all respondents. For those with children, median personal income was $59,000, and median family or household income was $102,000. For those without children, median personal income was $62,000, and median family income was $87,000.

Specialty choices are reported according to a system provided by the AMA Division of Survey and Data Resources. Under this system, 92 practice specialties are converted to nine major categories, including "other." Among the respondents reported on here, none of the individual specialties in the "other" category were equal to 5 percent of the entire sample. The respondents' specialty choices are shown in Table 1.

**TABLE 1**

**Percentages of 474 Respondents and 424 Nonrespondents to a Survey of 904 Women Physicians Concerning Issues of Pregnancy During Medical Career Who Practiced in Each of Nine Categories of Specialties, 1985***

| Specialty† | Respondents | | | Nonrespondents |
|---|---|---|---|---|
| | Total | With Children | Without Children | |
| Anesthesiology | 6 | 7 | 6 | 7 |
| General/family medicine | 11 | 12 | 10 | 10 |
| Internal medicine | 21 | 17 | 26 | 21 |
| Obstetrics and gynecology | 8 | 8 | 9 | 7 |
| Pediatrics | 23 | 27 | 16 | 22 |
| Psychiatry | 10 | 11 | 9 | 7 |
| Radiology | 4 | 4 | 3 | 4 |
| Surgery | 3 | 3 | 4 | 3 |
| Other | 20 | 20 | 19 | 19 |

* Six of the 480 respondents returned incomplete, unusable questionnaires, leaving a total sample of 474.

† The categories are those devised by the Division of Survey and Data Resources of the American Medical Association. The specialties of nonrespondents were learned from the AMA Physician Masterfile. The percentages for each specialty do not total 100 because 32 respondents listed more than one specialty.

**TABLE 2**

**Percentages of 474 Respondents to a Survey of 904 Women Physicians Concerning Issues of Pregnancy During Medical Career Who Reported Their Primary Professional Activity in Each of Nine Categories, 1985***

| Activity | Total | With Children | Without Children |
|---|---|---|---|
| Primarily academic medicine | 25 | 21 | 32 |
| Office-based practice | | | |
| Solo private practice | 22 | 24 | 21 |
| Two-physician group practice | 10 | 12 | 6 |
| Group practice | 21 | 23 | 16 |
| Health maintenance organization | 6 | 6 | 6 |
| Military | 1 | 1 | 2 |
| Industrial | 1 | 2 | 1 |
| Public health | 1 | 1 | 2 |
| Other | 11 | 10 | 14 |
| No answer | 1 | 2 | 0 |

* Percentages do not total 100 because of rounding.

The primary professional activities of the respondents are listed in Table 2. Fifty-nine percent were in office-based practice, and 25 percent were primarily in academic medicine. Those in academic medicine were in the following ranks: instructor, 22 percent; assistant professor, 54 percent; associate professor, 21 percent; full professor, 2.5 percent.

Background data on the age, specialty choice, and professional activity of the nonrespondents were available from the AMA Physician Masterfile. The nonrespondents were very similar to the respondents in age and specialty choice. The primary professional activity of respondents and nonrespondents was more difficult to compare, since the questionnaire used in the present study did not collect the data in the same way as the

AMA. However, the groups seem similar in that both 59 percent of the respondents and the nonrespondents listed office-based practice as their primary professional activity. The other nonrespondents listed hospital staff, 2.7 percent; teaching, 3 percent; research, 6 percent; administration, 1 percent; unclassified, 9 percent; and other 17 percent. It is not known how many of these would have answered "yes" to the question, "Are you primarily in academic medicine?" The percentage of the nonrespondents with children is not known; but two-thirds of the women in a 1984 AMA study (4) had children, and, therefore, the respondents are likely to be representative of women physicians in this regard.

### PREGNANCY TIMING

Seventy-seven percent of the respondents planned their first pregnancy, and 85 percent of these first pregnancies occurred between the ages of 26 and 34 years (mean = 29 years).

Timing of the first pregnancy in the survey group was a major interest in this study. In order to gauge timing, the respondents indicated both the stage of their medical career at conception and during the child's first year of life. Responses for all pregnancies are summarized in Table 3. Although 56 percent became pregnant with their first child during their residency or fellowship, 40 percent were in practice during their child's first year of life, indicating that many of these pregnancies occurred near the end of residency or fellowship programs.

In response to the question regarding advice on pregnancy timing to other women in medical training, 203 respondents suggested a specific time. Nearly 70 percent suggested that the best time for the first pregnancy is after completion of the residency program. The least ideal times were prior to medical school and internship, each suggested by only 1 percent of the group. During medical school was favored by 6 percent and during residency exclusive of the internship by 23 percent. A comparison was made of the actual timing of the respondents with children and their suggested ideal timing to determine whether women tended to rate their own timing as best. Of those who were first pregnant prior to medical school, 6 percent suggested that as ideal; of those first pregnant during medical school, 9 percent; internship year, 2 percent; other residency years, 20 percent; fellowship year, 16 percent; and in practice, 45 percent. From those women who

**TABLE 3**

**Percentages of 474 Respondents to a Survey of 904 Women Physicians on Issues of Pregnancy During Medical Career Who Conceived Their First Child and Had Responsibility for the First Year of the Child's Care at Different Stages of Their Medical Careers, 1985***

| Stages | Conception | First Year |
|---|---|---|
| Prior to medical school | 4 | 4 |
| During medical school | 7 | 4 |
| During internship | 11 | 6 |
| During other years of residency | 32 | 25 |
| During fellowship year(s) | 13 | 10 |
| While in practice | 28 | 40 |
| While on leave | 1 | 5 |
| Other | 4 | 6 |

did not mention a specific ideal time, the most frequent comment was that the stage of medical training was unimportant if good child care was available. Others mentioned the age of the physician as an important consideration for timing of pregnancy.

There was no statistically significant relationship between pregnancy timing and career choices or some of the traditional measures of success. For example, timing was not associated with medical specialty, type of practice (academic, private, military, or health maintenance organization), board certification, personal income, academic rank, or satisfaction with career or family.

### MATERNITY AND MEDICAL LEAVES

Only 33 percent of the respondents reported that their training or work sites had maternity leave policies at the time of their first pregnancy. Sixty percent of the respondents with children took maternity leaves of six weeks or less. Overall, the duration of maternity leaves was as follows: 23 percent, one to three weeks; 40 percent, four to six weeks; 21 percent, seven weeks to three months; 9 percent, four to six months; 4 percent, seven to 12 months; and 2 percent, greater than 12 months.

Seventeen percent had health problems during pregnancy that required some medical leave. A majority of these medical leaves were short, but a small percentage (5 percent) of the respondents required leaves of greater than eight weeks. Again, pregnancy timing did not significantly affect the duration of maternity or medical leaves. As to the availability of less strenuous work hours during pregnancy, 16 percent reported that part-time schedules and 22 percent reported that flexible schedules were available in their training program or workplace.

### SUPPORT

When asked how many pregnant women physicians they had personally known before becoming pregnant, 39 percent of the respondents reported none, 33 percent reported one or two, and 28 percent more than two.

Most respondents reported that their husbands were supportive. Specifically, 81 percent reported that their husbands were helpful at home during their pregnancy, 88 percent reported they were emotionally supportive during their pregnancy, 80 percent reported they were helpful at home during the child's first year of life, and 84 percent reported they were emotionally supportive during the child's first year of life. Little support was reported from training programs or workplace directors, as only 16 percent of the respondents reported their workplaces to be helpful during their pregnancy, 17 percent to be emotionally supportive, 12 percent to be helpful during the child's infancy, and 14 percent to be emotionally supportive during the child's infancy.

### HOURS WORKED

The number of hours worked per week was significantly associated with the number of children ($p < .05$ by chi-square). Twenty percent of those without children worked less than 40 hours per week, whereas 29 percent of those with one child ($n = 92$), 34 percent of those with two children ($n = 152$), 28 percent of those with three children ($n = 46$), and 46 percent of those with four or more children ($n = 24$) reported working less than 40 hours per week. The respondents with children included the 11 women with stepchildren.

### CAREER SATISFACTION

The respondents were asked to rate their satisfaction with their careers and with their personal lives on a 4-point scale from very satisfied to very dissatisfied. The women were satisfied overall with their careers (33 percent=very satisfied, 58 percent=satisfied). There was no statistically significant difference in career satisfaction between those with and without children ($p = .78$ by chi-square); 91 percent of those with children and 90 percent of those without children were satisfied with their careers.

Fifty-eight percent of the women with children expressed satisfaction with the amount of time available for their children. There were significant differences between the two groups regarding satisfaction with time for spouse ($p < .005$ by chi-square) and with time for self ($p < .0001$ by chi-square). Of the women with children, 49 percent were satisfied with time for spouse and 35 percent with time for self, compared with those without children, of whom 65 percent were satisfied with time for spouse and 63 percent with time for self. The women working fewer than 20 hours per week were significantly more likely to be satisfied than those working more than 20 hours with time for children ($p < .0005$ by chi-square) and spouse ($p < .001$ by chi-square), but they reported lower career satisfaction ($p < .05$ by chi-square).

## Discussion

In 1984, 85 percent of all U.S. women physicians in the 40–44 year age group had children (5). An equal percentage of women medical students want to have children, based on a survey (6) of 320 medical students in North Carolina, two-thirds of whom expected and 44 percent wanted to interrupt their careers for child-rearing. In both the present study and a 1984 AMA study (4), two-thirds of the women surveyed had at least one child, and about half of these mothers delivered a child during medical training. Seventy-seven percent of the women reported on in the present study planned their first pregnancy, a percentage identical to that reported in a study (7) of 56 pregnancies occurring over 10 years among residents of training programs affiliated with Harvard Medical School.

Many investigators feel that managing a medical career and a family takes an unusually high toll on women physicians (8, 9), as evidenced by their higher divorce rate and suicide rate compared with non-physician women. The peak incidence of impairment for women physicians coincides with the time of both early career development and childbearing (8). The biological imperative is that women must bear children during their reproductive years and someone, usually the mother, must be responsible for their needs (10). Taking time away from careers to nurture children is one of several reasons why many women may seem to be slower in developing their careers.

The number of first births for women aged 25–39 began to increase steadily in the 1970s, with the largest increases observed for women in their early 30s (11). During the period from 1975 to 1984, the birth rate for women in their early 30s rose 27 percent, while that for women aged 35–39 rose 17 percent (12). This trend has been closely tied to educational attainment by the mothers, as the rates of first births from women 30–34 years of age increased most for the best educated women (11). The women in the present study reflected this delay in first births, since 30 percent of those respondents with children had delayed their first pregnancy until age 30 or older. In a national study reported in 1974 (11), only 14 percent of married women aged 30–34 years had not yet had a first child, while in 1984 this figure was 23 percent.

As indicated by the timing of their planned pregnancies and their suggestions as to the best timing for pregnancy, the women in the present study favored the last years of the residency or fellowship and the early practice years as the best time for pregnancy. From their comments, it is clear that many women found pregnancy and their child's infancy to be a very stressful time. As one respondent commented, "No time is truly convenient for taking care of young children .... pregnancy was the easiest part .... any time can be improved by support at home and at work."

The present study is similar to the AMA (4) and Harvard (7) studies in which a majority of women physicians in training did not have maternity leave policies or flexible or part-time schedules available to them. Forty percent of the present respondents reported not even one role model of a pregnant physician. Many were pioneers at their institutions in negotiating their individual arrangements to accommodate pregnancy and early child care. Nevertheless, pregnancy timing per se appears not to correlate significantly with career choices, career success, or career satisfaction.

Women have pregnancies at less-than-ideal times for a variety of reasons, including age, family and/or religious preferences, health, and contraceptive failure. A typical comment was, "Having a child during residency makes life significantly more complicated, but considering my age I couldn't wait later to have my first child." While maternity leave policies, role models, and creative scheduling arrangements are important for all women (7, 10), they are especially helpful to women who are pregnant during the least ideal times.

The effect of pregnancy timing and short maternity leaves on breast feeding, the maternal-child relationship, and the ultimate well-being of the children has been looked at only briefly (13) and is an area that needs further study. One of the respondents brought to attention another issue of concern when she wrote, "One should have the foresight to expect that, if engaged in a full-time job including a call schedule, time at home with children will be very limited. I don't think I truly understood that, prior to having children." In fact, knowledge of the time and attention necessary for good parenting may not be appreciated by many in medical training, particularly women without mother-physician role models. Women also may experience unanticipated contentment with their children, causing for the first time some ambivalence about their careers (14). The data in the study reported here demonstrated that part-time hours were associated with increased satisfaction with time for child and spouse but with decreased career satisfaction. This finding is an example of the difficulty women experience in balancing career and family life. Elective courses or seminars on combining parenting and professionalism, as described (8) at the New Jersey Medical School of the University of Medicine and Dentistry of New Jersey, may be of real value to those considering the dual roles of doctor and parent.

The information derived from the study reported here should be of interest to women considering pregnancy during medical training and to those responsible for supervising and directing women in their medical careers. Increasing numbers of women in medical training will necessitate the development of policies, support, and education directed to women physicians who wish to coordinate career and pregnancy, and this study contains information on these issues.

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# Instruction in Research-Related Topics In U.S. and Canadian Medical Schools

*James R. Springer, Ed.D., and Lawrence J. Baer, Ph.D.*

**Abstract**—The authors conducted a study to collect information on the teaching of research-related topics at medical schools. A questionnaire was developed and mailed to appropriate administrators of all accredited United States, Canadian, and Puerto Rican medical schools that asked for information on courses offered in epidemiology, statistics, evaluation of medical literature, and research design. Ninety-seven percent of the medical schools responded to the questionnaire. All but one of the 139 respondents reported offering formal instruction in at least one of the four topics; epidemiology and statistics were offered by 98 percent and 96 percent, respectively, of the responding schools. Training in evaluating medical literature was required by slightly less than half of the responding schools, and research methodology was required by one-third. Future studies should evaluate the effectiveness of such courses.

Teaching research-related topics to medical students has been widely accepted and endorsed by medical educators, researchers, and administrators. The 1984 report of the Project Panel on the General Professional Education of the Physician and College Preparation for Medicine (the GPEP report) recommended, "Faculties should assist students in the development of their abilities to apply the rules of evidence and the law of logic to clinical, investigative, and published data in order to estimate the validity, reliability, and utility of those data" (1). This recommendation demonstrates the nationwide consensus supporting the importance of these topics. This report also recommended, "Faculty should cultivate the critical appraisal skills of medical students by more clearly defining and requiring their participation in research projects, journal clubs, Socratic sessions, and clinical teaching rounds that frequently pose the question, 'How good is the evidence for that?'"

Knowledge of and ability to perform research are increasingly important in graduate medical education. For example, the section on research in the "Special Requirements for Residency Training in Orthopedic Surgery" issued by the Accreditation Council for Graduate Medical Education (ACGME) for 1987–88 stated: "Residents must develop competence in critical assessment of new medical therapies and of medical literature. Residents must learn the design and interpretation of research studies . . . . faculty expertise

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and time must be available to stimulate and supervise resident research. Research productivity for residents and faculty must be documented" (2). This wording is a significant change from the 1984 ACGME statement on research in orthopaedics, which stated in total: "Reasonable facilities for research by the residents should be provided. Research activities should be documented" (3). Other specialties have also increased emphasis on research activities by "strongly recommending" rather than merely "recommending" research (2, 3).

The importance of practicing physicians' developing and maintaining critical appraisal and research skills is evident in continuing medical education trends. In reviewing self-directed learning among physicians, Richards (4) found that physicians cited reading professional literature as the most frequent and most valuable method they used in continuing their professional learning (4). Lifelong learning for physicians requires, then, that they have the ability to read professional literature critically (5).

In spite of the increasing emphasis being placed upon the learning, use, and documentation of research skills for medical students, residents, and practicing physicians, there is evidence that recent efforts to educate these populations have not succeeded. The GPEP report concluded, "Medical students are deficient in their ability to evaluate critically clinical and scientific evidence" (1). In addition, Berwick and colleagues (6) examined the performance of medical students, house staff members, practicing physicians, and academic physicians in coping with quantitative data and drawing inferences from it. They concluded, "Important problems exist in the consumption of quantitative information by medically trained individuals." Neame and Powis (7) attributed the problem to flaws in medical schools' curricula, which failed to introduce students to published medical literature in an organized manner and failed to teach students how to read literature critically.

In the present study, the authors collected information on the teaching of research-related topics in North American medical schools.

## Methods

The authors developed a questionnaire that asked for information on course offerings in epidemiology, statistics, evaluation of medical literature, and research design. These four areas were felt to encompass those research principles necessary for a well-based understanding of medicine and would also be needed by physicians to maintain competency in their rapidly changing profession. The questions asked whether these courses were elective or required and taught as separate subjects or formally integrated into other courses; who taught these subjects (that is, by full-time or part-time faculty members and by instructors with which academic degrees); the number of years the courses or topics had been offered; whether the school evaluated the instruction; and if these courses were not taught, why they were not taught.

In 1987 this questionnaire was sent, personally addressed, to the deans or other appropriate persons responsible for curricula at all 143 U.S., Canadian, and Puerto Rican medical schools listed in the *1987-88 AAMC Directory of American Education* (8). One or two follow-up letters and duplicate questionnaires were sent to the deans who did not respond.

The relationships between the size of the total enrollments at the medical schools, as reported by the deans' offices, and their course offerings were examined.

## Results

The overall response rate was 97 percent (139 of 143 schools), and all the Canadian and Puerto Rican schools responded. All but one (99 percent) of the responding schools offered formal instruction in epidemiology, statistics, literature evaluation, and/or research methodology. Epidemiology and statistics were the most frequently offered, as shown in Table 1. Similarly, these two topics were most frequently required, with more than 80 percent of the responding schools requiring them. Training in evaluating medical literature was required by slightly less than one-half (44 percent) of the schools, and research methodology was required by one-third. The four topics were offered as specific courses at 40 percent to 63 percent of the medical schools and were integrated into other courses at another 31 percent to 35 percent.

For each of the four areas, instruction was usually offered during the first two years of medical school, as shown in Table 2. Almost 90 percent of the schools used instructors with M.D. or Ph.D. degrees for these courses; overall 34 percent used instructors who held both M.D. and Ph.D. degrees; and only 14 percent used instructors with master's degrees. Full-time faculty members taught the topics at 87 percent of the schools, and clinical faculty members taught them at 30 percent of the schools.

Ninety percent of the schools evaluated the effectiveness of their research-related courses. The median length of time during which these research-related subjects

**TABLE 1**

**Percentages of 139 U.S. and Canadian Medical Schools Teaching Each of Four Research-Related Topics, by Category and Format of the Offering, 1987***

| Topics | Category | | Format | | Offered in Any Form |
|---|---|---|---|---|---|
| | Required | Elective | Separate | Integrated | |
| Epidemiology | 87 | 13 | 63 | 35 | 98 |
| Statistics | 83 | 8 | 62 | 34 | 96 |
| Literature evaluation | 44 | 24 | 42 | 35 | 78 |
| Research methodology | 31 | 35 | 40 | 31 | 72 |

* The deans of all 143 medical schools accredited by the Liaison Committee on Medical Education in the United States, Canada, and Puerto Rico were sent questionnaires; 139 responded.

**TABLE 2**

**Percentages of 139 U.S. and Canadian Medical Schools Teaching Research-Related Topics at Each Curricular Year, 1987***

| Topics | Year 1 | Year 2 | Year 3 | Year 4 |
|---|---|---|---|---|
| Epidemiology | 44 | 53 | 10 | 15 |
| Statistics | 47 | 40 | 7 | 9 |
| Literature evaluation | 30 | 29 | 19 | 20 |
| Research methodology | 27 | 30 | 17 | 23 |

* The deans at all 143 medical schools accredited by the Liaison Committee on Medical Education in the United States, Puerto Rico, and Canada were sent questionnaires; 139 responded.

had been taught was 10.2 years; the range of reported lengths was 0 to 146 years.

The schools offering these research-related courses had slightly more students on average than the schools that did not. Those offering epidemiology, for example, had average enrollments of 515, while those that did not had an average of 420. The findings for the other three topics were: 516 for those offering statistics, 451 for those that did not; 524 for those offering literature evaluation, 476 for those that did not; and 520 for those offering research methodology, 497 for those that did not.

## Discussion

Nearly all (99 percent) of the medical schools responding to the present study offered some form of instruction in epidemiology, statistics, research methodology, and/or literature evaluation. However, these topics have been offered for a median of only 10.2 years, and many schools do not offer courses in many of these subjects (Table 1). The most frequently cited reasons for not teaching these topics were lack of time in the curriculum and relative unimportance of these topics; other reasons given were student boredom with the topics, limited faculty skills to teach the subjects, and difficulty integrating the topics into the curriculum. The one school that did not teach any of the topics in any form felt that because no specific department was assigned responsibility for these areas, these subjects were not taught.

Epidemiology and statistics, those subjects with long histories and structured mathematical bases, were most frequently offered and required. This finding may be due to the relative ease in obtaining textbooks and materials and faculty members with degrees in the subjects. Research methodology and literature evaluation, conversely, are areas for which teaching materials are not readily available and are areas so broad in scope as to make course design difficult. Also, adequately trained and experienced instructors for these two areas may not be available. One responding dean cited this problem as the reason for not teaching research methodology and literature evaluation. In addition, it may be that medical school faculties assume that entering medical students have gained sufficient training in research methodology and design.

Although the medical schools that offered these courses tended to have more students, this difference did not seem significant, with a maximum difference in average class size of 24.

The research-related topics were usually presented during the first two years of medical school, ideally the time to build basic knowledge. The finding that the topics are less often taught in the third and fourth years may imply that most schools fail to reinforce their earlier instruction. The authors' personal experience has indicated that once students are made aware of the importance of these research-related areas, they often express a desire for a four-year sequence of teaching in these topics. Such a sequence could begin with an introduction to statistics, research design, and epidemiology and continue with frequent reinforcement through practical application during clinical training.

The extremely high response rate attained in this study (97 percent) indicates that these data represent the status of research-related instruction in all accredited U.S., Canadian, and Puerto Rican medical schools. This high response rate may be a measure of the importance and interest in this topic to medical educators.

## Implications

While the data reported here imply that medical schools, collectively, are meeting the need for research-related training described in the GPEP report, other authors (6, 7) have provided disquieting information on the ineffectiveness of this training. Studies should evaluate the effectiveness of the courses offered. Ideally, these studies would follow medical students from their initial experiences in research through residency training and in medical practice. Results of such studies could be used to evaluate the effectiveness of the most common method physicians use in the self-directed learning—reading and evaluating published medical material.

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(the retitled, redesigned *Journal* beginning in January 1989)

*Academic Medicine* will contain both peer-reviewed and non-peer-reviewed articles. Non-peer-reviewed articles will be accepted in three categories: major articles and essays, short opinion pieces ~~and letters to~~ the editor.

Complete instructions for submitting articles will be published in the October 1988 and January 1989 issues. The following summary of these instructions gives general information for authors submitting articles for the peer-reviewed section of *Academic Medicine*.

**Categories of peer-reviewed articles.** *Academic Medicine* will have three types of peer-reviewed articles: major articles, short articles, and research notes.

1. Major articles should have no more than 15 standard double-spaced pages of typed manuscript text, 15 references (30 for literature reviews), and five tables or figures. It should have an abstract of 100–150 words.
2. Short articles should have no more than four standard double-spaced pages of text with no figures or tables, or three pages plus one figure or table, and no more than 10 references. It should have an abstract of no more than 100 words.
3. A research note should be 250 words in length (one double-spaced page) and have no reference list, figure, or table (one or two references may be cited in full in the text).

**How to submit manuscripts.** Manuscripts are considered with the understanding that they are not under consideration elsewhere and have not been previously published. Short abstracts of preliminary research reports presented at conferences and included in conference proceedings do not constitute previous publications; however, presentations longer than an abstract may disqualify the paper.

Papers are reviewed by specialist reviewers, the editor, and occasionally by consulting editors or members of the Editorial Board. All manuscripts will be edited critically by the editorial staff, and the authors must proofread and approve galley proofs.

All authors of accepted papers must assign copyright of the article to the Association of American Medical Colleges and must sign a statement of authorship.

To submit a manuscript, send the following:

1. Two copies of the manuscript
2. A cover letter (signed by the first author or designated corresponding author) stating that the paper has not been previously published and is not under consideration by another journal and noting any inclusion of abstracts or portions of the paper in conference proceedings or similar monographs.

**Format and references.** Prepare the following materials:

1. Title page. Give the title (limited to two lines written in caption style, that is, it should not be a sentence); the byline (the authors' names; academic degrees; licensure titles); and the authors' identification (in sentence format, giving each author's surname, position held, department or division, institution, and city and state).
2. Abstract. This should be approximately 150 words in length.
3. Text. It may be written in first or third person.
4. Tables and figures. Each should appear on a separate sheet and have a descriptive legend that will make the figure or table clearly understandable independent of the text.
5. References. Citations should be numbered in the order in which they appear and be identified by superscripts. Citations should be prepared according to the *Chicago Manual of Style* (13th edition), with journal citations prepared in the humanities style (Style A). See sample entries below.

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# Home Care Services as Teaching Sites For Geriatrics in Family Medicine Residencies

*Edgardo Laguillo, M.D.*

**Abstract**—Evaluating the physical and psychological constitution of elderly patients and their social and cultural environments requires skills that should be taught to all physicians in training. A survey was conducted among all accredited U.S. residency programs in family medicine to examine training in geriatrics. The teaching sites most commonly used by the responding programs were the family practice center (used by 96.4 percent), nursing home (81.9 percent), family medicine inpatient ward (62.4 percent), and home care service (HCS) (48.2 percent). The professional most frequently in contact with the resident during training at an HCS was the attending physician. Longitudinal rotations (that is, long-term rotations involving part of each week for months or years) in geriatrics were used more often than block rotations. The HCS rotations ranked highest in residents' evaluations were those in which the resident followed patients long-term and discussed problems and management with a multidisciplinary team. A combined rotation involving a family practice center, a family medicine inpatient ward, and a home care service is discussed as an alternative method of teaching geriatrics in family medicine.

In the coming decades an increasing proportion of the U.S. population will be aged 65 years and older. This shift in the demographic distribution will result in increased demands for inpatient, long-term care and community services for the elderly in all nations (1), and additional medical manpower will be needed to meet the needs of this growing segment of the population (2). In order to achieve the proposed goal of providing higher quality of care in a cost effective manner, teaching programs must face up to the task of educating more and better trained professionals to provide for the needs of the elderly (3).

The need to incorporate geriatrics and gerontology into the curriculum of family practice and other primary care specialties has been well documented (4–8). It has also been clearly stated that long-term care facilities in the community (such as nursing homes, seniors centers, seniors housing projects, and home care services) should all be training settings for geriatrics (1, 11). The advantages of teaching trainees about the delivery of health care in patients' homes have been pointed out (9), yet there has been little or no initiative from educators and program directors of primary care specialties to incorporate formally home care skills and knowledge into their trainees' education (10). Fur-

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thermore, integrating teaching programs with home care units in an effort to develop a working model for service, teaching, and research has been overlooked.

## Methods

A survey was conducted of all 380 residency programs in family medicine accredited by the Accreditation Council for Graduate Medical Education. A questionnaire was mailed to the programs in January 1987, followed by a second request to nonrespondents six weeks later. The questionnaire was especially designed for this study and addressed issues such as characteristics of geriatrics training, teaching sites used for geriatrics, and amount of time residents spend in these sites.

All questionnaires received before May 15, 1987, were included in the analysis reported here. The investigation was conducted to examine the integration of home care services (HCS) into geriatrics curricula in family medicine. A home care service is a freestanding, government-sponsored or hospital-based organization that provides equipment and services for medical or social support to patients in their place of residence.

In order to focus upon HCS, specific items were included in the questionnaire on the amount of time the resident spends in the HCS as compared with other teaching sites, professionals in direct contact with the trainee, reasons for including HCS as teaching sites, and evaluations of the HCS experience.

## Results

Of a total of 380 programs, 282 (74.2 percent) responded: community-based programs, 188 (67 percent); university-based programs, 62 (22 percent); freestanding programs, 20 (7 percent); and military programs, 12 (4 percent).

The respondents were asked whether their geriatrics programs used longitudinal rotations, block rotations or a combination of both. (Longitudinal rotations involve part of a week for several months or the entire residency; block rotations involve the resident's time for a short period, such as a few days or weeks.) The responses showed that 140 (49.6 percent) of the programs used longitudinal rotations for geriatrics training, 24 (8.5 percent) used block rotations, and 109 (38.6 percent) used both.

Of all the respondents, 147 (52.1 percent) reported devoting from 200 to 400 hours to teaching geriatrics throughout the three years of training, 92 (32.6 percent) spent 200 hours or less, while 35 programs (15.3 percent) devoted more than 400 hours.

Teaching sites most commonly used for geriatrics training were the family practice center (96.4 percent), nursing home (87.9 percent), patients' home (81.9 percent), the family medicine inpatient ward (62.4 percent), and home care services (48.2 percent). Sites such as rehabilitation wards, hospices, and seniors centers were used by approximately 27 percent of the programs, whereas outpatient academic geriatric units, ambulatory geriatric clinics and inpatient geropsychiatric wards were each reported by less than 25 percent of the programs.

The distribution of time spent by residents of the different programs in the various teaching sites is presented in Table 1. More than half of the geriatrics teaching time was spent in the FPC (as reported by 22 percent of the programs) as compared with 15 percent for those who used nursing homes. In 107 programs (82 percent) less than 10 percent of their teaching time was devoted to home care services.

Of the 136 programs that used HCS as training sites, 132 directors rated their

**TABLE 1**

**Percentages of 282 Family Practice Residencies Devoting Different Amounts of Time to Each of the Types of Sites for Geriatrics Training, 1987***

| Teaching Site | Percentage of Time Spent | | |
|---|---|---|---|
| | More Than 50 | From 11 to 49 | Less Than 10 |
| Family practice center | 22.1 | 72.1 | 5.7 |
| Nursing home | 15.7 | 49.6 | 34.7 |
| Patient's home | 0.4 | 14.3 | 85.3 |
| Family medicine inpatient service | 5.4 | 77.2 | 17.4 |
| Home care service | 0.0 | 17.7 | 82.3 |
| Rehabilitation ward | 1.4 | 33.3 | 65.3 |
| Hospice | 0.0 | 5.5 | 94.5 |
| Seniors center | 0.0 | 15.6 | 84.4 |
| Geropsychiatric ward | 0.0 | 36.8 | 63.1 |
| Ambulatory geriatric clinics | 8.6 | 51.7 | 39.6 |
| Outpatient academic geriatric unit | 22.5 | 42.5 | 35.0 |

**TABLE 2**

**Numbers and Percentages of 136 Family Practice Residencies Using Home Care Services (HCS) as Geriatrics Training Sites That Used Each of Five Activities for Residents in the HCS Component, 1987***

| Teaching Strategies | No. | Percent |
|---|---|---|
| No scheduled activities | 28 | 20.5 |
| Observes evaluation of patients performed by health professional | 41 | 30.1 |
| Performs only episodic interventions on patients | 51 | 37.5 |
| Performs evaluations and long-term follow-up of patients and has periodic discussions with attending physician | 60 | 44.1 |
| Performs evaluation and long-term follow-up of patients and has periodic discussions with multidisciplinary team | 36 | 26.4 |

* The survey questionnaire was sent to all 380 U.S. family medicine residencies; 282 responded, and 136 of them used HCS sites for geriatrics training.

reasons for including HCS as teaching sites. They rated the importance of their reasons by a Likert-type scale, ranging from very important to not important at all. The questionnaire gave the respondents four possible reasons. Of these, the directors rated three as very important: the HCS provided good sites for teaching continuity of care (80 percent of the programs), for exposing trainees to the multidisciplinary team approach (76.5 percent), and for teaching cost-containment issues (48.4 percent).

Once in an HCS unit, a resident's activities varied in different programs. The percentages of programs with HCS training that used each of five teaching strategies is shown in Table 2. The two strategies used most frequently were having the resident perform evaluation and follow-up of patients and hold discussions with the attending physician (used by 44 per-

**TABLE 3**

**Number of 53 Family Medicine Residencies That Evaluated Their Geriatrics Training Components in Home Care Service (HCS) and the Number and Percentage of These Components That Received High and Low Ratings, by the Teaching Strategy Used for the HCS Component, 1987**

| Teaching Strategies | No. of Programs | Ratings* | | | |
|---|---|---|---|---|---|
| | | 5 or Less | | 6 or More | |
| | | No. | Percent | No. | Percent |
| No scheduled activities | 9 | 3 | 33.3 | 6 | 66.6 |
| Observes evaluation of patients performed by health professional | 15 | 4 | 27.0 | 11 | 73.0 |
| Performs only episodic interventions on HCS patients | 29 | 6 | 21.0 | 23 | 79.0 |
| Performs evaluation and long-term follow-up of patients and has periodic discussions with attending physician | 20 | 4 | 20.0 | 16 | 80.0 |
| Performs evaluations and long-term follow-up of patients and has periodic discussions with multidisciplinary team | 20 | 2 | 10.0 | 18 | 90.0 |

* The survey questionnaire was sent to all 380 U.S. family medicine residencies; 282 responded. Of these, 136 used HCS sites for geriatrics training, and 53 of these evaluated their HCS components.

cent of the programs) and having the resident perform only episodic interventions on HCS patients (37.5 percent).

Forty-six percent of the respondents identified the attending physician as the professional most frequently in contact with residents during the HCS experience. Other professionals reported as also having close contact with the resident were registered nurses (47 programs) and social workers (23 programs). Also 43 programs reported contact between residents and home health aides. Professionals reported as having little or no contact with the resident were occupational therapists, physical therapists, and licensed practical nurses.

Of the 136 programs that used HCS, 53 (39 percent) had evaluated the HCS rotation by the time of the survey. These program directors were asked to rank the evaluations of the HCS experience as evaluated by the residents in their program. The overall evaluation ranking (on a range of 1 = poor to 10 = excellent) reported by the directors of these programs is presented in Figure 1.

The relationship between the activity of the residents performed in the HCS and the residents' evaluation of the rotation is presented in Table 3. The comparison of the residents' activities and their evaluation of the HCS component shows that (*a*) the programs providing no scheduled activities in the HCS component had the highest proportion of lower ratings (overall, ratings of five or less out of 10) and (*b*) the programs that used evaluations and follow-up of patients combined with periodic discussions between the resident and the multidisciplinary team had the lowest proportion of such lower ratings.

## Discussion

Evaluating the physical and psychological constitution of an elderly patient and the patient's social and cultural environments requires skills that should be taught to all residents in primary care. This ger-

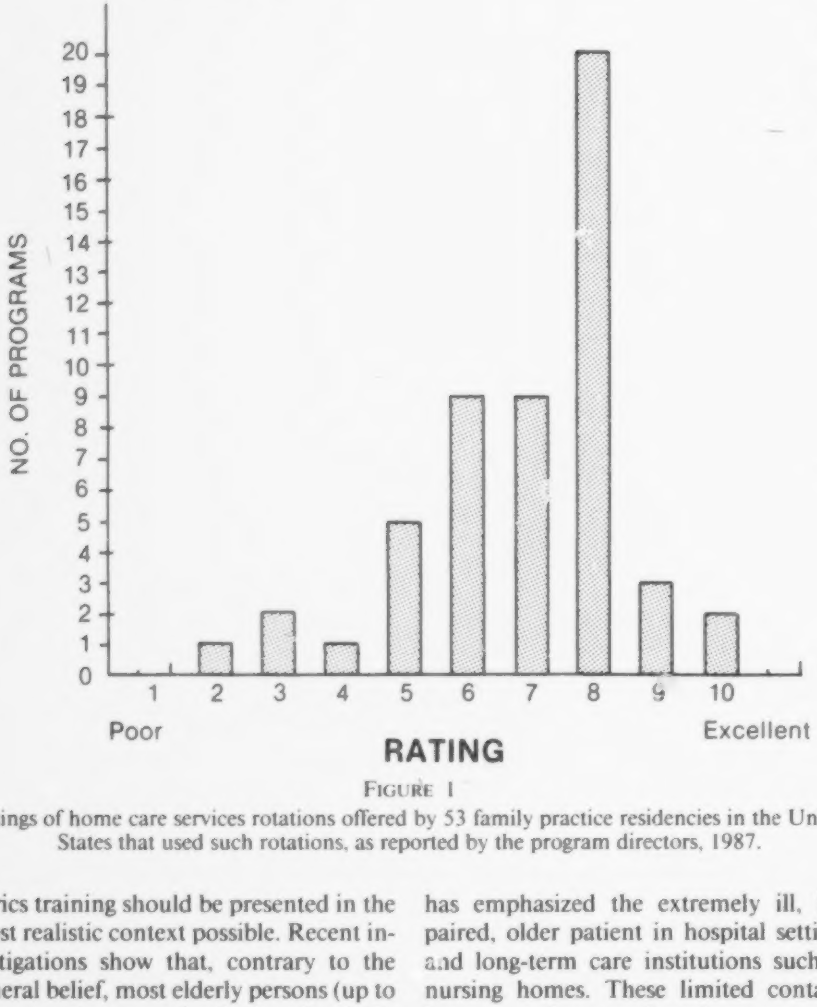

FIGURE 1

Ratings of home care services rotations offered by 53 family practice residencies in the United States that used such rotations, as reported by the program directors, 1987.

iatrics training should be presented in the most realistic context possible. Recent investigations show that, contrary to the general belief, most elderly persons (up to 95 percent) are not institutionalized (3). Indirect evidence indicates that medical care for this vast majority is deficient, as supported by facts such as a decline in the length of the patient-physician encounter as age increases, even though the elderly have multiple medical problems that are more complex than those of younger patients (2).

Historically, geriatric training in medical schools and postgraduate programs has emphasized the extremely ill, impaired, older patient in hospital settings and long-term care institutions such as nursing homes. These limited contacts between trainees and patients not only reinforce trainees' negative stereotypes and attitudes towards the elderly but also stress the concept of curative, episodic medicine, to the detriment of the preventive, continuing approach. Diseases common among the elderly—mild functional disabilities and other noncatastrophic conditions—are underemphasized.

Primary care physicians are responsible for most of the care of the elderly. General practitioners and family physicians provide most of their nonhospital care (2). Most problems presented by the aged do not require exotic diagnostic and treatment protocols; rather, they are better approached by a multidisciplinary team, in coordination with the family and community groups.

The study presented here shows that most of the programs surveyed prefer the longitudinal and the combined (longitudinal and block) rotation formats. Block rotations, particularly those which emphasize hospitalized and institutionalized patients only, may prove to be deficient in providing the resident the necessary exposure to the healthy elderly living in the community.

A vast majority of the programs used the family practice center (FPC), nursing home, or patient's home, alone or in various combinations, as teaching sites. Of the 272 programs that reported using the FPC as a teaching site, 247 had the residents spend most of their time in this setting; only 6 percent reported using it less than 10 percent of the time. The programs using the rest of the most frequently used teaching sites (family medicine inpatient service, HCS, rehabilitation ward hospices, and senior centers), had residents spend less than 50 percent of their time in each site used.

In the past, the nursing home had been a classical teaching site for geriatrics in primary care (12). In the family medicine programs reported on here, the use of nursing homes was still very popular, both in frequency and in exposure time to the residents, as compared with other reported sites.

HCS were the fifth most frequently used teaching site in family medicine residencies, according to the present survey, but the amount of time that the resident spent in the HCS was very limited. Of the 136 programs using HCS as teaching sites, 82 percent reported having the residents spend only 10 percent or less of the total geriatric teaching time in the HCS. This finding is in clear contrast to the time spent at other rotation sites.

## Recommendation

In order to assume the best and most integrated teaching of geriatrics it is essential to accept the following concepts. Short, isolated rotations through acute care facilities or long-term care institutions do not provide the right type of experience in continuity of care, common problems of the elderly, and socioeconomic factors affecting well-being and illness. Physicians trainees should have experiences in home, community, and ambulatory care settings such as HCS, FPCs, patients' homes, and geriatric day-care centers. These experiences will not only provide the opportunity for the trainees to see the elderly as productive individuals who can be free of diseases but also will teach about alternatives to institutionalization for the long-term care of the aged.

What can make HCS units more attractive or accessible as teaching sites to training programs in family medicine? The availability of HCS in the community and their accessibility to training programs may be major determinants. Nowadays changing health care policies promote the dispersion of HCS in almost every community. Training programs in family medicine must recognize the potential for education within an HCS. Health professionals who provide day-to-day care for the elderly can easily be part of the training team for residents. Every health professional may contribute significantly to a resident's training if specific and well-structured teaching objectives are provided. As noted in the present survey, the HCS programs best ranked in resident evaluations were those in which the principal activity was the long-term follow-up of assigned patients and discussion of the patients' problems with a multidisciplinary team.

The combination of experiences in the HCS, FPC, and inpatient ward may prove to be an effective alternative to other methods of teaching geriatrics to residents. By coupling these clinical experiences with an integrated or parallel classroom component, family medicine programs can cover most of the recommended learning objectives for the geriatrics curriculum. These three training settings are readily accessible to most training programs and will certainly provide the training in continuity of care that is so important in primary care residencies.

In the family medicine inpatient ward, the resident would be able to learn about proper use of diagnostic tests, interpretation of diagnostic procedures, pharmacokinetics and pharmacodynamics in the aged, assessment and therapeutic interventions of common diseases in the elderly, including atypical presentations, psychiatric manifestations of organic diseases, and exacerbation of chronic illnesses.

The FPC would be the main site for teaching such aspects of geriatrics as drug-induced signs and symptoms, evaluative tools for cognitive function, special considerations in the diagnosis and treatment of multiple chronic problems in the elderly, preventive care, health maintenance, and nutritional assessment and treatment.

Home care services would be a rewarding teaching experience in understanding the principles of team management and interdisciplinary and multidisciplinary approach to health care, impact of the social environment on health and disease, implementation of rehabilitation protocols, appropriate use of community-based support systems for the elderly, home assessment of functional status of the elderly, risk analysis and accident prevention, recognition of the role of the care-giver and the stressors involved in the patient—care-giver relation at home, the role of intermediate care of the recently acutely ill patient, and the importance of discharge planning and its implementation. With the implementation of prospective payment systems and diagnosis-related groups (DRGs), early discharge of still sick patients is more the rule than the exception, and the physician trainee should have the diagnostic and intervention skills needed to manage these situations. Other inherent advantages that HCS provide are the opportunity to learn about family-interviewing skills, assessment of family dynamics and its implications in the care of the elderly, and the ability to obtain a holistic view of the aged within the context of their sociocultural milieu.

In the survey reported here, 91 (32.3 percent) of the 282 already had this three-part training. No data are available at present regarding the effectiveness of these combined settings in fulfilling the goals and objectives of geriatrics teaching. An interesting topic for future investigation would be the evaluation of those programs which use this combination. Also of interest would be the experience of other specialty training programs, such as internal medicine, regarding the use of HCS in their geriatrics curricula.

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# Journal of Medical Education

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# Substance Abuse Units Taught by Four Specialties In Medical Schools and Residency Programs

*Ardis K. Davis, Frances Cotter,*
*and Dorynne Czechowicz, M.D.*

**Abstract**—Four medical specialty organizations conducted a survey of 294 departments in 98 medical schools and 1,124 residency programs to identify the number and type of curriculum units on substance abuse offered by these specialties. A curriculum unit was defined as a formal block of teaching on substance abuse. A total of 251 (85 percent) of the medical school departments and 828 (74 percent) of the residency programs responded. Of those, 175 (70 percent) of the medical school departments and 479 (58 percent) of the residency programs reported offering at least one curriculum unit on substance abuse. There was considerable variation among the four specialties in the number and percentage of departments or programs reporting such units. Overall, a majority of the units addressed both alcohol and other drugs, were required, and included a clinical component. Evaluations of content and teaching strategies are needed to examine the quality and adequacy of substance abuse training.

Concern about the use and abuse of alcohol and other drugs in the United States is not new, but during the past decade there has been an increasing awareness of the medical profession's influence in the prevention and treatment of substance abuse. For this reason, medical educators have placed a growing emphasis on substance abuse training in medical education.

Institutional barriers have long been cited as the primary reason that substance abuse is not universally included in medical school curricula (1). Attempts were made in the 1970s to overcome such barriers through the federally sponsored Career Teacher Program (2). A national survey of drug-abuse and alcoholism teaching in medical and osteopathic schools (3) and a subsequent follow-up study of a sample of those schools (4) concluded that although improvements had occurred there remained a need for additional substance abuse training in medical education.

Kamerow and colleagues (5) reported in 1986 that the level of training did not match the magnitude of the substance

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This report is based on survey data collected by four medical specialty organizations under contracts supported by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) and the National Institute on Drug Abuse (NIDA).

Ms. Davis is an independent medical educator in substance abuse in Seattle, Washington, and is project coordinator, Substance Abuse Faculty Development Program of the Society of Teachers of Family Medicine, Kansas City, Missouri; Ms. Cotter is coordinator, Health Professions Education Program in the Division of Clinical and Prevention Research of the NIAAA; and Dr. Czechowicz is associate director for medical and professional affairs in the Office of Science of the NIDA.

abuse problem, and Hanlon (6) reported that a relevant clinical experience is required in substance abuse training. In addition, there is growing interest in increased substance abuse training for the clinical medical specialties (7). As recently as 1986, Moore and Malitz (8) reported that residents in ambulatory care settings underdiagnose alcoholism and that there is a corresponding need to improve training of physicians in ambulatory practice settings (8). This potential for alcoholism screening in ambulatory practice is receiving increasing attention, as documented recently (9). Prevention and early diagnosis and intervention in substance abuse, thus, have a logical place in specialty training programs, but implementing such curricula remains difficult (10).

To determine future directions for substance abuse training in medical education, however, medical educators need answers to two questions: To what extent is substance abuse formally taught to medical students and residents in clinical medical specialties? How is it being taught?

In 1986 the National Institute on Alcohol Abuse and Alcoholism (NIAAA) and the National Institute on Drug Abuse (NIDA) financed studies that would describe alcohol and other drug abuse training in medical education in the United States. Four medical specialty organizations contracted with the institutes to conduct these studies for their respective specialties: the Society for Research and Education in Primary Care Internal Medicine, now the Society of General Internal Medicine), the Society of Teachers of Family Medicine, the Ambulatory Pediatric Association, and the American Psychiatric Association. These specialty groups worked together on a survey of each of their training programs for both medical students and residents. The findings from this survey form the basis of this report.

## Methods

In February and March 1986, each of the four specialty organizations mailed a survey questionnaire to the directors of accredited residency training programs and the chairpersons of medical school departments in its specialty throughout the United States and Puerto Rico. There were some variations among the specialties in their initial contact and follow-up methods, the most notable being that the pediatrics society included a supplemental set of survey questions as part of their initial mailing. Follow-up procedures included mailing a follow-up questionnaire (used by family medicine and psychiatry) and telephone follow-up during which additional survey data were collected (used by internal medicine). In addition, the psychiatry and family medicine societies conducted telephone sampling of nonrespondents. All contacts by the specialty organizations were completed by July 31, 1986.

The survey instrument was designed jointly by representatives from each specialty and, with minor variations reflecting specialty-specific interests, was accepted for use by all four specialties. The survey requested information on the content and teaching approaches for each curriculum unit on substance abuse in a given residency program or medical school department. A curriculum unit (CU) was defined as any formal block of teaching on substance abuse. This definition allowed a CU to include instructional approaches ranging from a single lecture to a seminar, teaching module, clerkship, or clinical rotation. Such a definition was chosen in an attempt to include the broadest possible range of instruction on substance abuse.

Recipients were asked in an explanatory cover letter to forward the survey instrument to their faculty members responsible for teaching substance abuse. In the internal medicine medical school survey, the instrument was to be forwarded to faculty members responsible for the physical diagnosis and core clerkship courses and to any other faculty members who taught independent, selective, or elective courses on substance abuse. For all specialties, if no substance abuse units existed, recipients were asked to so indicate and return the form in the envelope provided.

In addition to the surveys by the four specialties, the American Medical Student Association conducted a simultaneous survey using the same questionnaire but directed at medical school curriculum deans.

The survey data were coded, entered in computer files, and analyzed separately by each medical specialty, after which the data from the four specialties' residency programs were merged into one data base for analysis. The medical school data were managed differently. A total of 133 medical schools and branch campuses were contacted by one or more of the four specialties. Because of a low response rate from pediatric departments and the corresponding uncertainty about the degree to which such responses were representative of pediatric programs nationally, only analyses of data from the other three specialties were considered. In order to facilitate comparisons of curriculum units across specialties within medical schools, only data from those institutions contacted by all three specialties were used in the analyses and results reported here. Preliminary analyses revealed that the overall differences in the characteristics of the curriculum units from this subset of schools and those from the larger group of 133 schools (including the pediatric data) were minimal.

## Results

A total of 294 medical school departments in 98 medical schools were contacted by the specialty organizations representing family medicine, internal medicine, and psychiatry. A total of 1,124 residency programs were contacted by the family medicine (381), internal medicine (291), pediatrics (232), and psychiatry (220) organizations.

Eighty-five percent (251) of the medical school departments and 74 percent (828) of the residency programs responded. The response rates for the medical school departments were 91 percent for internal medicine, 86 percent for psychiatry, and 80 percent for family medicine. Two schools did not respond to any of the three specialties, and six reported no curriculum units, leaving 90 schools reporting one or more CUs. Of these 90 schools, 28 reported CUs from one specialty only, 39 from two specialties, and 23 from all three specialties. For the residency programs, the response rates were: internal medicine, 80 percent; psychiatry, 77 percent; family medicine, 76 percent; and pediatrics 60 percent.

The specialties varied considerably in the number and percentage of residency programs and medical school departments reporting CUs, as shown in Table 1. The survey identified and described 308 medical school CUs and 605 residency CUs in substance abuse.

### RESIDENCY PROGRAMS

Over half (62 percent) of the CUs reported by residency programs were part of larger courses or clinical rotations (49

**TABLE 1**

**Numbers and Percentages of U.S. Medical Schools and Residency Programs That Reported Offering a Curriculum Unit on Substance Abuse in Each of Four Specialties, 1986***

| Departments/Programs | No. of Respondents | Respondents Reporting Units on Substance Abuse | |
|---|---|---|---|
| | | No. | Percent |
| Medical School Departments† | | | |
| Family medicine | 78 | 52 | 67 |
| Internal medicine | 89 | 41 | 46 |
| Psychiatry | 84 | 82 | 98 |
| Total | 251 | 175 | 70 |
| Residency Programs | | | |
| Family medicine | 288 | 195 | 68 |
| Internal medicine | 232 | 93 | 40 |
| Pediatrics | 139 | 38 | 27 |
| Psychiatry | 169 | 153 | 91 |
| Total | 828 | 479 | 58 |

* Survey questionnaires were designed jointly by four specialty organizations and administered separately by those organizations. See text for details on these organizations, the questionnaires, and the definition of curriculum unit. A total of 294 departments in 98 medical schools and 1,124 residency programs were contacted.

† Because of the low response rate from pediatrics departments, pediatrics data were not analyzed or reported.

percent, psychiatry; 63 percent, family medicine; 71 percent, pediatrics; 81 percent, internal medicine). The remaining CUs were entire rotations or independent courses on substance abuse. The majority of all CUs were required (86 percent) and offered yearly (89 percent). A large proportion (84 percent) contained training in both alcohol and other drugs, although this combination was less often the case in internal medicine. Over half of the pediatric CUs addressed tobacco addiction, whereas approximately one-quarter to one-third of the CUs in the other three specialties did so.

A majority (72 percent) of the curriculum units included clinical experiences. The family medicine CUs included such a clinical component most frequently (84 percent), followed by psychiatry (72 percent), pediatrics (65 percent), and internal medicine (53 percent). General medical settings and substance abuse treatment settings were often combined for these experiences, as shown in Table 2. The clinical experiences often occurred in inpatient settings, whether in a general medical setting in a hospital or in a residential treatment setting for substance abuse.

Of the CUs that provided experiences in substance-abuse treatment settings, a majority (85 percent) combined two or more of these settings for the clinical exposure.

The clinical experiences were often supplemented with other teaching strategies. Each of the following strategies was used in more than half of the CUs with clinical components: lecture; clinical demonstration (for example, patient interview by instructor); required readings; conference or case presentation; seminar; and films or videotapes. The units with-

**TABLE 2**

**Percentage of Medical School and Residency Curriculum Units on Substance Abuse With Clinical Experiences That Used Each Type of Clinical Treatment Setting, 1986***

| Setting | Medical School Units ($n = 162$) | Residency Units ($n = 434$) |
|---|---|---|
| Type of Clinical Setting Used | | |
| General medical only | 21 | 16 |
| Substance abuse only | 19 | 19 |
| Both | 60 | 65 |
| Type of General Medical Setting Used† | | |
| Ambulatory | 48 | 61 |
| Inpatient | 65 | 71 |
| Emergency | 41 | 52 |
| Type of Substance Abuse Treatment Setting Used† | | |
| Hospital-Based Ambulatory | 28 | 43 |
| Community-Based Ambulatory | 25 | 31 |
| Inpatient | 65 | 68 |
| Self-Help group | 50 | 52 |
| Detoxification | 44 | 56 |

* Survey questionnaires were designed jointly by four specialty organizations and administered separately by those organizations. See text for details on these organizations, the questionnaires, and the definition of curriculum unit. A total of 294 departments in 98 medical schools and 1,124 residency programs were contacted. Overall, the survey identified 308 units in medical schools and 605 units in residency programs; of these, 162 medical school units had clinical experiences and 434 residency units had clinical experiences.

† Because some units were reported as using more than one setting, the percentages do not total 100.

out clinical experiences tended not to use as great a variety of teaching strategies. Of these units, most (93 percent) used lectures and slightly over half used seminars.

The curriculum units covered a broad range of topics. The topics most frequently covered were related to general concepts (that is, definition, natural history) of substance abuse (95 percent), diagnosis (94 percent), and epidemiology and sociocultural factors (90 percent). Other topics often covered were physicians' attitudes towards substance-abusing patients (87 percent), acute management (89 percent), and long-term management (85 percent). Although covered by 70 percent of the units, prevention was among the topics least frequently addressed.

Within three of the specialties, physicians in that specialty tended to have sole responsibility for teaching the curriculum units: psychiatrists alone were responsible for teaching 70 percent of the psychiatry CUs, pediatricians alone were responsible for teaching 69 percent of the pediatrics CUs, and internists alone were responsible for teaching 51 percent of the internal medicine CUs. Family physicians taught units alone in 12 percent of their units. Nonphysicians (for instance, behavioral science faculty members or substance abuse counselors) teaching alone (26 percent) or in combination with a family physician (26 percent) assumed responsibility for teaching in more than half of the family medicine CUs.

Only 37 percent of all the CUs formally evaluated the residents.

### MEDICAL SCHOOLS

Both alcohol and other drugs were covered in a majority (82 percent) of the CUs offered at medical schools. This combination was more often the case in psychiatry than in either family medicine or internal medicine. About three-quarters (74 percent) of the CUs were part of another course, clerkship, or rotation. The balance were separate clerkships or independent courses devoted entirely to substance abuse. Most CUs were required (77 percent) and offered yearly (99 percent). Slightly over one-third specifically addressed tobacco addiction.

Clinical experiences were included in slightly more than half (53 percent) of the curriculum units. A similar proportion of CUs across all specialties provided such a clinical component. Settings in general medical facilities and substance abuse treatment facilities were frequently combined for this clinical exposure, as shown in Table 2. Overall, inpatient settings were more frequently used than outpatient settings. In 74 percent of the units providing clinical experiences in a substance-abuse treatment setting, two or more such settings were used for this clinical exposure.

Each of the following teaching strategies was used in over half of the units with clinical components: required readings, lecture, clinical demonstration, seminar, conference or case presentation, and films or videotapes. The CUs with no clinical components tended to use fewer strategies. Three strategies were used in more than half of these units: lecture, required readings, and films or videotapes.

Examination of the topics covered in the CUs revealed that, as with the residency units, a variety of topics was covered. Over 80 percent of the CUs covered general concepts (that is, definition, natural history) of substance abuse, epidemiology and sociocultural factors, diagnosis, and physicians' attitudes towards substance-abusing patients. The topics least frequently covered were prevention (63 percent of the CUs) and legal aspects (44 percent).

Psychiatrists teaching alone were responsible for teaching a majority (68 percent) of the psychiatry CUs. Responsibility for teaching the internal medicine CUs lay largely with internists alone (48 percent) or with a combination of medical specialties (39 percent). Nonphysicians (for instance, behavioral science faculty members or substance-abuse counselors) assumed total or partial responsibility for teaching in almost half (49 percent) of the family medicine CUs, while approximately one-third (31 percent) were taught by family physicians alone.

A majority of the CUs (76 percent) included evaluation of the students. Such evaluation was more common for psychiatry than for family medicine or internal medicine units.

## Discussion

In the four medical specialties surveyed, medical schools and residency programs varied considerably in integrating substance abuse units into their curricula. Where integrated, the units often occurred as part of the required curriculum, tended to address both alcohol and other drugs, and frequently included clinical experiences.

Several conclusions emerge from these findings. First, training in substance abuse is not universally integrated into the medical school and residency curricula of family medicine, internal medicine, and pediatrics. Psychiatry does approach more universal inclusion of substance abuse instruction at both educational levels than do the other specialties. Similar trends have been previously reported (11). Most medical students and residents, therefore, receive some substance abuse training through psychiatry departments and programs. Extending training in substance abuse offered through the other three specialties would lead to a more thorough and integrated coverage of substance abuse and reinforce the importance of the physician's role in early identification and intervention.

Second, where offered, the instruction is generally part of the required curriculum, a situation which represents a significant departure from the past practice of offering substance abuse training primarily as an elective within a clinical program. This change may indicate an increasing acceptance of substance abuse teaching as an integral part of medical training; conversely, it may indicate more acquiescence to outside pressures than true acceptance of substance abuse instruction as a fundamental component of medical education. The finding that substance abuse training usually occurred as part of a larger course, clerkship, or rotation and the finding that responsibility for teaching substance abuse units tended to be assumed by specialists within the department or program offering the unit may reflect increasing pressures on educators to comply with allotments of curricular time for substance abuse.

Third, an appreciation of the value of teaching substance abuse in clinical settings, previously stressed in the literature (6), appears to be increasing. Along with this appreciation may be a growing recognition of the importance of using a combination of teaching methods and clinical settings. Although these are encouraging signs, the practice of using inpatient settings for clinical exposure, especially in a general medical facility, remains questionable. Reliance on inpatient settings, where students and residents are less likely to see patients along the entire continuum of substance use, abuse, and dependence, should be reconsidered. Other options may better enhance learning about prevention, early diagnosis, and intervention.

Fourth, the breadth of topics covered in teaching raises a question about how thoroughly any of these are addressed. The data collected in this study did not provide this information. However, some speculation on the relative priority afforded certain topics may be warranted. Prevention receives a low priority relative to other topics in all specialties at both educational levels. Training in prevention is essential to understanding how best to incorporate early intervention strategies into medical practice. This area of training, in addition to closely related areas such as physician impairment, warrants further investigation.

The results reported here must be interpreted within the context of this study's limitations. First, the survey did not determine the number of instructional hours allotted to substance abuse. It is not known to what extent the curriculum units reported to be part of a larger curricular offering represented a single session or otherwise limited exposure to substance abuse content. Second, variability in the reporting of curriculum units was inevitable with the use of four different administration methods. Additional reporting variability may have resulted from the broad definition given to a curriculum unit. For example, recent evidence from another survey of residency training programs (12) may suggest that some programs reporting no curriculum units in this survey indeed had a single lecture on substance abuse.

The findings reported here indicate a lack of comprehensive substance abuse instruction across clinical specialties in medical school and residency training. Similar conclusions have been recently reported elsewhere (10). However, the substance abuse instruction in medical training appears to be headed in a positive direction. The increasing inclusion of substance abuse instruction as part of the required curriculum, the opportunities for clinical application, and the attention to both alcohol and other drugs in training are all encouraging. Yet, questions remain concerning the adequacy with which medical students and residents are being prepared to help prevent or intervene early in the development of problems related to substance abuse. Further investigations should be conducted on the relative priority that substance abuse instruction is afforded in the overall clinical curriculum and on the depth and quality of this training.

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# Substance Use by Fourth-Year Students At 13 U.S. Medical Schools

*Scott Conard, M.D., Patrick Hughes, M.D., DeWitt C. Baldwin, Jr., M.D., Karl E. Achenbach, Ph.D., and David V. Sheehan, M.D.*

**Abstract**—Fourth-year medical students at 13 medical schools in different regions of the United States received an anonymous questionnaire designed to examine their current and prior use of 11 substances and their attitudes toward substance use among physicians. Of 1,427 questionnaires distributed, 41 percent were returned. The questionnaire and distribution method were derived from an ongoing survey on drug use in order to permit comparison of the medical students with a national sample of age- and sex-matched cohorts. The rates of substance use during the 30 days preceding receipt of the questionnaire were: alcohol, 87.8 percent; marijuana, 17.3 percent; cigarettes, 9.0 percent; cocaine, 5.6 percent; heroin, 0.0 percent; other opiates, 0.9 percent; LSD, 0.2 percent; other psychedelics, 0.5 percent; barbiturates, 0.5 percent; tranquilizers, 2.2 percent; and amphetamines, 1.2 percent. Compared with their age and sex cohorts nationally, the medical students reported less use of marijuana, cocaine, cigarettes, LSD, barbiturates, and amphetamines. However, their use of other opiates was approximately the same and their use of tranquilizers and alcohol was slightly higher than that of the other cohorts. Data on their sources of knowledge about drug abuse indicate the need for greater attention to this issue in the medical curriculum.

Available data on medical students' substance use share several major limitations. First, the samples studied were generally small and nonrepresentative. With the exception of a recent study that surveyed 483 medical students and 489 medical practitioners in one state (1), most investigators studied the use of a single drug (2–5) or the students of a single class or school (6–10). A second limitation is that investigators used different survey methods with different questionnaire items, so that substance-use rates in the various studies cannot easily be compared, either with one another or with national samples. Further, when comparisons were made, the influence of demographic vari-

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ables known to affect substance-use rates (for example, gender) were not explored.

To overcome these limitations, the present authors undertook a study of substance use among senior medical students at 13 medical schools in different regions of the United States. A survey questionnaire was used that permitted the sample to be compared with a large national sample of young people of similar age (11, 12). In the present article, the authors report patterns of substance use among the sample of senior medical students and compare these patterns with those of a representative national sample of young people. They also review the study method and its limitations and suggest modifications to be employed in future research.

## Methods

The substance-use questionnaire selected was based upon one administered annually to graduating high school students across the country since 1975 (11, 12). To this questionnaire were added a number of items on demographic variables and questions specifically relating to attitudes about substance use and opinions about impaired physicians. Because of the recent increase in cocaine use, questions were asked on that substance. The resulting questionnaire consisted of demographic items (including age, gender, class standing) and 112 items concerning the use of 11 frequently abused substances, the sources of knowledge for these substances, and attitudes toward a physician's use of them.

As with the studies by Johnston and colleagues (11, 12), the sampling approach consisted of selecting schools in different regions of the country as a way of securing a nationally representative sample. Although, a random sampling of all medical students throughout the country might have been more truly representative, the difficulty of securing accurate addresses and the desire for comparability of methods dictated using an approach through selected schools.

In late April 1986, the questionnaires were sent to 13 schools selected from the four major regions of the country: three each from the Northeast, Southeast, and Midwest and four from the West. Because the study started late in the academic year, one selection criterion was that a school's students would not graduate until May or June. Even using this criterion, lower response rates were secured from the schools with earlier graduation dates.

The questionnaires, along with letters guaranteeing anonymity and confidentiality, were mailed directly to the president of the senior class at each medical school with the exception of one in the West, where the questionnaires were sent to the dean of students' office. To elicit cooperation in distributing the questionnaires and to enhance the response rate, a small honorarium was paid to each class president. No financial incentive was offered to the students. Follow-up telephone calls were made to the class presidents asking them to encourage the cooperation of nonresponding classmates, although no individual contact or second mailing to nonrespondents was possible. Class presidents provided each graduating senior with a copy of the questionnaire, a separate machine-readable answer sheet, and a stamped return envelope addressed to the first author.

## Results

Of 1,427 questionnaires distributed, 589 usable responses were received, for an overall response rate of 41 percent. A check for internal consistency was performed on the substance use data. Discrepancies in the responses for alcohol use were found in five records and for cocaine use in one record. These records were excluded from analyses involving alcohol or cocaine, respectively.

The mean age of the sample was 27.6 years, with 74.7 percent of the students in the age category of 25–29 years. Women comprised 35 percent of the total sample, which is a percentage comparable to national figures on sex distribution among medical students. Forty-nine percent of the study group were single and 44 percent married, with the remainder separated, divorced, or widowed. A majority of the respondents were white (88 percent) with Asians constituting 6.3 percent, Hispanics 3.4 percent, blacks 2.2 percent, and Alaskans or Native Americans 0.2 percent. The distribution of self-reported class standing for the total sample was markedly skewed, with only 9 percent placing themselves in the lower third of their class; 35 percent reported being in the middle third, while 55 percent reported being in the upper third. These findings suggest that the sample was biased toward students reporting higher class standing.

### SUBSTANCE USE

Figure 1 presents the overall prevalence of substance use by the total sample of 589 respondents. For each of the 11 substances, the figure shows the percentage of medical students who reported use ever in their lifetime, in the past year, in the previous 30 days, and 20 or more times in the previous month (designated as daily use). Patterns of use for all 11 substances are discussed below, starting with the most frequently used substance (alcohol) and proceeding to the least frequently used (heroin).

Alcohol was clearly the most widely used drug, with 97 percent reporting at least one use in their lifetime, 95 percent in the previous year, 88 percent in the previous month, and 9 percent daily. These rates are consistent with those reported by Maddux and colleagues (10), among whose medical students, 96 percent reported using alcohol in their lifetime, 91 percent in the previous year, and 82 percent in the previous month.

Marijuana was the second most frequently used substance, with 74 percent reporting use in their lifetime, 32 percent in the previous year, 17 percent in the previous month, and 1.2 percent daily. These rates are also consistent with surveys of medical students by McAuliffe and colleagues (1). Of those students, 72 percent reported using marijuana in their lifetime, and 34 percent in the previous year.

Cocaine was the third most frequently used substance, a somewhat alarming but not surprising finding, given the national epidemic of cocaine use at the time of the study. (This survey was done prior to the much-publicized cocaine-related deaths of athletes Len Bias and Don Rogers.) Thirty-six percent of the students reported cocaine use in their lifetime, 17 percent in the previous year, and 6 percent in the previous month; no students reported daily use. These responses are comparable with those reported by McAuliffe and colleagues (1)—39 percent had used it in their lifetime and 20 percent in the previous year. The only study that examined cocaine use in medical schools prior to the 1980s reported much lower rates of use (13).

Cigarettes ranked as the fourth most frequently used substance in the previous year (13 percent), with 9 percent having smoked cigarettes in the previous month and 5 percent daily. The questionnaire did not ask about any use in their lifetime. These data again correspond closely with those of Maddux and colleagues' (10) sample, 12 percent of whom reported smoking cigarettes in the previous month.

Tranquilizers, including benzodiazepines, were the fifth most widely used substance, used in their lifetime by 22 percent, in the previous year by 11 percent, and by 2 percent in the previous month; none reported daily use.

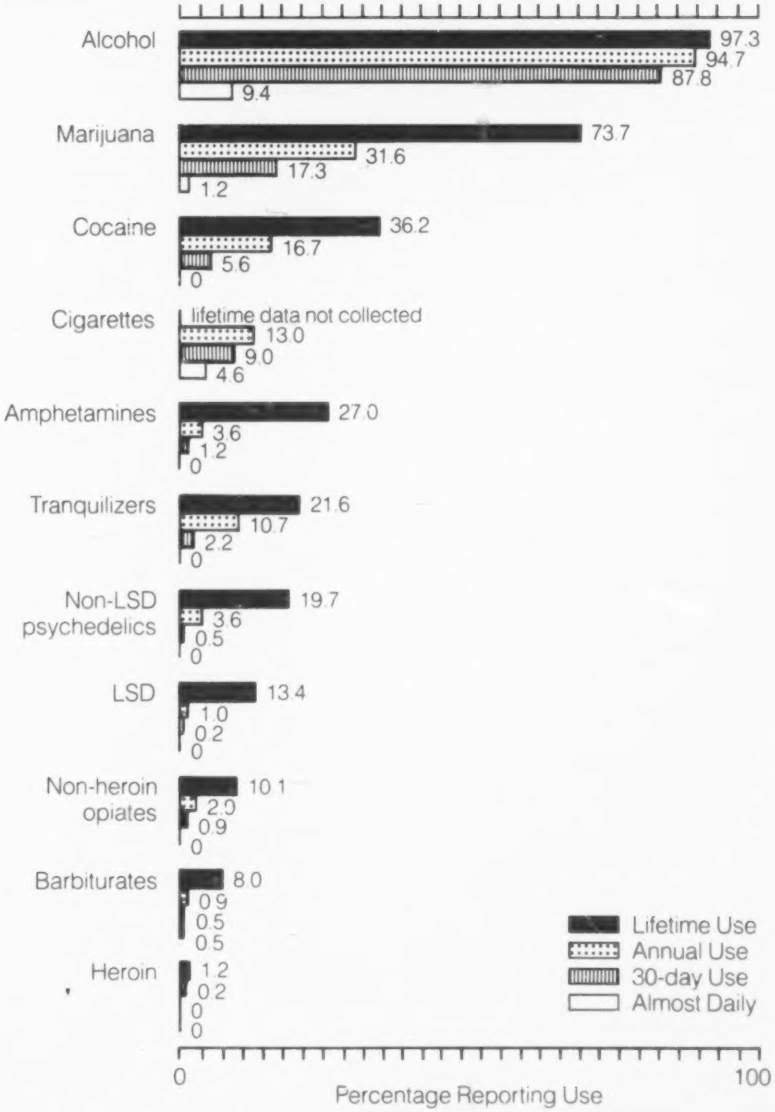

FIGURE 1

Percentage of 589 fourth-year students at 13 regionally distributed U.S. medical schools who reported using each of 11 substances at least once in their lifetime, in the previous year, in the previous month, and daily, 1986.

Amphetamines appear to have been infrequently used by this medical student sample. Although 27 percent reported using these substances at least once in their lifetime, less than 4 percent had used amphetamines in the previous year, 1 percent in the previous month, and none reported daily use. McAuliffe and colleagues (1) found that 17 percent of the medical students they questioned had ever used stimulants, and 2 percent were occasional users at the time of their study.

Psychedelics, excluding D-lysergic acid diethylamide (LSD), were the seventh most frequently used substances. Again, 20 percent reported use in their lifetime, but use at the time of the study was less than 4 percent in the previous year, less than 1 percent in the previous month, and no daily use. McAuliffe and colleagues (1) found similar use rates, with 19 percent reporting recreational use ever in their lifetime and 2 percent reporting occasional use at the time of the study.

LSD had a reported lifetime use of 13 percent, with 1 percent in the previous year and 0.2 percent in the previous month. These data suggest that about one in seven of the respondents may have used LSD at some time but that virtually none of them was using this substance at the time of the survey.

Opiates other than heroin were used by only 10 percent of the sample during their lifetime, with 3 percent having used them in the previous year, less than 1 percent in the previous month, and no daily use. Opiate use by physicians has been of historical interest due to concern over reported dependence among physicians. The sample reported on here did not show any particular preference for opiates. These findings are consistent with those of McAuliffe and colleagues (1), where only 8 percent had ever used opiates recreationally and 2 percent reported occasional use at the time of the survey. However, Maddux and colleagues (10) reported much higher (40 percent) lifetime use (mostly codeine), 19 percent in the previous year and 6 percent in the previous month.

Barbiturate use at some time in their life was reported by less than 8 percent of medical students. Less than 1 percent reported use in either the previous year or the previous month. Given the declining use of these substances in clinical practice, these data raise the question of whether abuse of these substances by medical students and -physicians may soon be largely of historical interest only. McAuliffe and colleagues' (10) data on recreational use of sedatives were similar, with 11 percent of their respondents reporting recreational use in their lifetime and no one reporting recreational use at the time of the study, although 1 percent reported occasional self-treatment and another 1 percent regular self-treatment. Maddux and colleagues' (10) rates for sedative use were higher, with 17 percent reporting use in their lifetime, 3 percent in the previous year, and 2 percent in the previous month.

Heroin was the least used substance, with only 1 percent having ever used it and less than 0.2 percent using it in the previous year. None used it in the previous month. Neither Maddux and colleagues (10) nor McAuliffe and colleagues (1) reported on heroin use.

### SOURCES OF KNOWLEDGE

The respondents were asked to identify their major source of knowledge for each substance except cigarettes. Their responses, shown in Table 1, suggest that reading and lectures were the primary sources of drug information. The exceptions were alcohol and marijuana, for which friends and acquaintances were reported to be the most important sources (29.7 percent and 50.8 percent, respec-

**TABLE 1**

**Percentages of 589 Fourth-Year Students at 13 Regionally Distributed Medical Schools Reporting Their Major Source of Knowledge for 13 Substances, 1986**

| Drug | Friends or Acquaintances | Family | Reading | Patients | TV, Films, Radio | Lecture | No Response |
|---|---|---|---|---|---|---|---|
| Alcohol | 29.7 | 10.4 | 27.2 | 4.4 | 4.9 | 22.8 | 0.7 |
| Marijuana | 50.8 | 2.4 | 29.5 | 0.0 | 6.5 | 9.8 | 1.0 |
| Cocaine | 23.6 | 0.7 | 36.7 | 1.7 | 12.9 | 23.4 | 1.0 |
| Heroin | 3.1 | 0.3 | 46.4 | 2.9 | 14.9 | 31.1 | 1.4 |
| Narcotics | 2.6 | 0.0 | 47.4 | 1.9 | 8.3 | 38.4 | 1.5 |
| LSD | 17.8 | 0.8 | 44.1 | 0.3 | 14.1 | 21.7 | 1.0 |
| Other Psychedelics | 17.2 | 0.7 | 42.6 | 0.7 | 11.7 | 25.8 | 1.4 |
| Barbiturates | 4.8 | 0.5 | 47.2 | 0.5 | 4.8 | 41.3 | 1.0 |
| Tranquilizers | 4.8 | 1.2 | 46.0 | 1.4 | 4.8 | 40.7 | 1.2 |
| Amphetamines | 12.6 | 0.5 | 44.7 | 0.0 | 6.1 | 35.3 | 0.8 |

tively). Also of note was the relatively greater importance of friends and acquaintances (23.6 percent) and TV, film, and radio (12.9 percent) for knowledge about cocaine. Little reliance upon clinical contact with patients as a major source of knowledge was seen for any of the substances.

### ATTITUDES

The students were asked to choose from a list of possible consequences for physicians who used various substances from once or twice to regularly. Table 2 indicates that the respondents recommended different consequences for different substances. For example, over 96 percent felt that experimental use (once or twice) of alcohol and marijuana should carry no negative consequences for the physician. In contrast, half the students (52 percent and 49 percent, respectively) felt that physician experimentation with heroin or barbiturates should have consequences ranging from mandatory treatment to suspension or revocation of the medical license. Attitudes toward experimental use of amphetamines, cocaine, and LSD were intermediate between these two responses, though LSD use was viewed as more serious than the other two.

The respondents also recommended different consequences based upon the frequency of drug use. For example, the great majority felt that physicians who regularly used any of the drugs listed should be required to receive treatment and have their licenses suspended or revoked. Also, 87 percent felt that regular heroin use should result in license suspension or revocation, and 74 percent responded similarly for regular LSD use. Regular marijuana use was judged as of less concern; 19 percent recommended no consequences for regular physician users, while a majority (59 percent) recommended required treatment. Their concern for frequency of use was also striking in the case of alcohol, where a majority (67 percent) accepted one or two drinks most days with no consequences but reversed their views for four to five drinks most days, for which only 4 percent felt there should be no serious consequences.

## Comparison with National Sample

Whether the substance-use rates reported in the present survey should signal alarm or encouragement depends on how these rates compare with rates for other people of the same age. Although several studies

**TABLE 2**

**Percentages of 589 Fourth-Year Students at 13 Regionally Distributed Medical Schools Recommending Each of Five Responses to Physicians' Use of Seven Substances, 1986**

| Physicians' Use | Recommended Response | | | | |
|---|---|---|---|---|---|
| | Do Nothing | Require Treatment | Suspend License | Revoke License | No Response |
| Trying marijuana once or twice | 95.9 | 3.4 | 0.5 | 0.0 | 0.2 |
| Smoking marijuana occasionally | 76.4 | 20.2 | 2.2 | 0.3 | 0.8 |
| Smoking marijuana regularly | 18.7 | 58.6 | 21.1 | 1.0 | 0.7 |
| Trying LSD once or twice | 63.7 | 18.7 | 13.2 | 2.9 | 1.5 |
| Taking LSD regularly | 1.4 | 23.3 | 60.4 | 14.1 | 0.8 |
| Trying heroin once or twice | 46.2 | 29.4 | 18.3 | 4.9 | 1.2 |
| Taking heroin occasionally | 5.8 | 37.5 | 45.0 | 10.4 | 1.4 |
| Taking heroin regularly | 1.5 | 10.5 | 63.9 | 23.6 | 0.3 |
| Taking barbiturates occasionally | 49.6 | 36.0 | 10.9 | 2.4 | 1.2 |
| Taking barbiturates regularly | 1.9 | 38.7 | 52.6 | 6.5 | 0.3 |
| Trying an amphetamine once or twice | 77.3 | 13.2 | 6.3 | 2.2 | 1.0 |
| Taking amphetamines regularly | 2.4 | 47.5 | 43.5 | 5.3 | 1.4 |
| Trying cocaine once or twice | 76.1 | 13.2 | 7.0 | 2.5 | 1.2 |
| Taking cocaine regularly | 1.5 | 38.9 | 50.8 | 7.8 | 1.0 |
| Trying one or two drinks of an alcoholic beverage | 97.8 | 1.4 | 0.3 | 0.0 | 0.5 |
| Taking one or two drinks nearly every day | 67.2 | 27.0 | 3.9 | 0.3 | 1.5 |
| Taking four or five drinks nearly every day | 3.9 | 48.0 | 45.3 | 1.5 | 1.2 |
| Having five or more drinks once or twice each weekend | 36.5 | 43.6 | 17.8 | 1.5 | 0.5 |

have attempted to compare medical students with other professional students (1, 7), none compared them with same-age cohorts in the general population.

Using items from the survey instrument used by Johnston and colleagues (11, 12) permitted the present authors to compare their own sample of medical students with Johnston's nationally representative sample of over 2,500 (the exact number varies from question to question in the survey) young people, originally surveyed in 1976–78 as high school seniors and surveyed again in the second half of 1985, roughly eight months prior to the present study. The mean age of the Johnston sample at the time of the present study was 26.3 years, slightly younger than the 27.6 years recorded for the medical student group. Seventy percent of the Johnston sample were high school graduates and 30 percent college graduates. Fifty-five percent were women. Because epidemiological research on drug abuse has established that men are more likely to be substance users, and because it was deemed desirable to compare medical students with high school and college graduates of similar age, the sample of medical students in the present study were compared with the Johnston sample, controlling for education and sex. For brevity, only the five most frequently used substances in the present study are discussed below.

The percentage of medical students who reported using alcohol in their lifetime (97 percent) is similar to that of their counterparts in the larger society (97 percent for college and 95 percent for high school graduates). Daily use among men was greater than that among women for both samples. Both men (90 percent) and women (84 percent) medical students were more likely to have used alcohol in the previous month than college-graduate men (86 percent) and women (79 percent and high-school–graduate men (82 percent) and women (68 percent); however, this different was not statistically significant ($p > .05$).

Figure 2 shows that use of marijuana in their lifetimes for the men and women medical students was similar to that of their respective sex cohorts in the national comparison sample. When marijuana use in the previous year and month was compared, however, there was a clear tendency for the medical students to use this substance less frequently than either the high school or college graduates. For the previous year, 32 percent of the medical students (men, 36 percent; women, 24 percent), 36 percent of the college graduates (men, 41 percent; women, 31 percent), and 39 percent of the high school graduates (men, 47 percent; women, 33 percent) reported use. For the previous month, the medical students reported a rate of 17 percent (men, 21 percent; women, 11 percent), while the figures for the college and high school graduates were 21 percent (men, 34 percent; women, 22 percent) and 27 percent (men, 34 percent; women, 22 percent), respectively. The relationship is clear for both sexes and is statistically significant (chi-squares: previous year = 6.69, previous month = 17.07, $p < .05$). Only 1 percent of men and women medical students reported daily marijuana use, while these percentages were 5.5 percent and 2 percent respectively for college graduates and 11.3 percent and 5 percent for high school graduates.

Cocaine use showed a similar pattern,

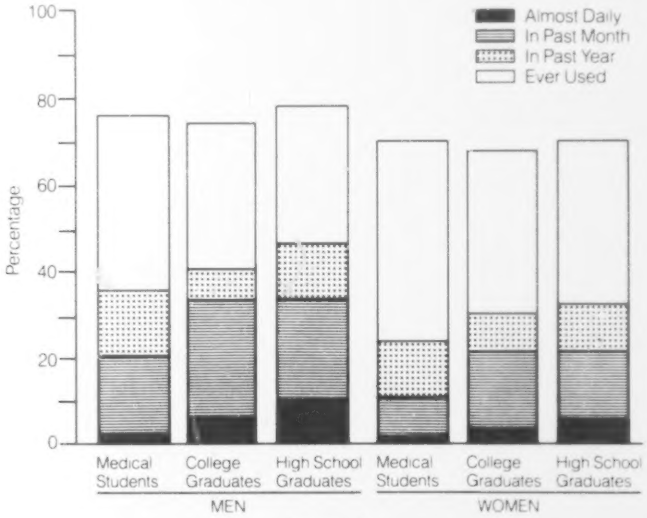

FIGURE 2

Percentages of 589 fourth-year students at 13 regionally distributed U.S. medical schools and of approximately 2,500 high school and college graduates (data on graduates from Johnston and colleagues [11]) who reported using marijuana at least once in their lifetime, in the previous year, in the previous month, and almost daily, 1985–1986.

with the medical students less likely and the high school graduates more likely than the college graduates to have used this substance in the previous year and month. For the previous year, 17 percent of the medical students (men, 21 percent; women, 11 percent), 20 percent of the college graduates (men, 26 percent; women, 14 percent), and 23 percent of the high school graduates (men, 29 percent; women, 18 percent) reported use. For the previous month, 6 percent of the medical students (men, 7 percent; women, 4 percent), 8 percent of the college students (men, 8 percent; women, 7 percent), and 10 percent of the high school graduates (men, 14 percent; women, 8 percent) reported use. The only daily users were men high school graduates. These differences are statistically significant (chi-squares: previous year = 7.35, previous month = 10.62, $p < .05$).

Figure 3, on the use of cigarettes, shows the most dramatic differences between the samples. Only 4 percent of the men medical students in this study were daily smokers, a rate that is one-tenth the rate (40 percent) for men high school graduates of similar age. While 5 percent of the women medical students used cigarettes daily, they were about one-seventh as likely to be daily smokers as their high school counterparts (34 percent). These differences also are statistically significant (chi-squares = 207.15, $p$ = .0001).

The data for tranquilizer use show that both the men (11 percent) and women (10 percent) medical students were more likely to have used tranquilizers in the previous year than their age-related counterparts. The men medical students were slightly more likely to have used tranquilizers in the previous month (13 percent) than the other men (1 percent for men college graduates and 2 percent for men high school graduates). These differ-

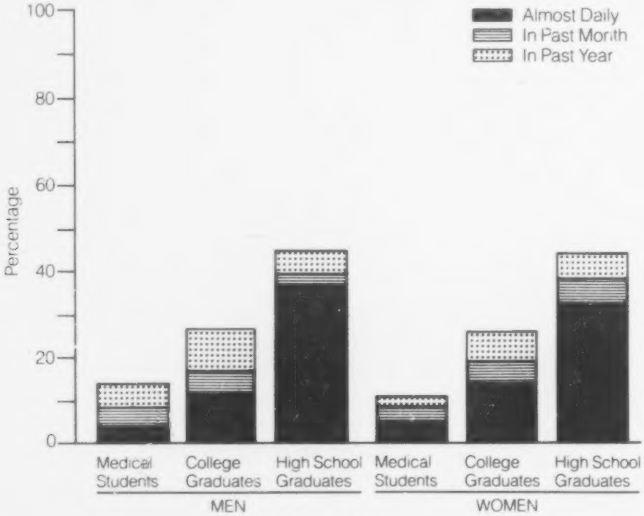

FIGURE 3

Percentages of 589 fourth-year students at 13 regionally distributed U.S. medical schools and of approximately 2,500 high school and college graduates (data on graduates from Johnston and colleagues [11]) who reported using cigarettes in the previous year, in the previous month, and almost daily, 1985–1986.

ences also are statistically significant (chi-squares: previous year = 10.78, previous month = 9.22, $p < .05$).

## Discussion

This study demonstrated the feasibility of collecting national data on medical students' substance use. By using a questionnaire already in use elsewhere, the medical student data could be compared with that of a large, representative national sample of young people surveyed in 1985. By controlling for gender, the researchers could compare medical students' substance use with that of their counterparts in the larger society, matched by age, sex, and education.

Because the present study had a 41 percent response rate from a sample possibly skewed toward the upper one-third of the medical class, any interpretations of the data and generalizations of the results to all medical students must be viewed with caution. However, the following findings appear worthy of note:

1. As expected, the types of substance use among senior medical students appear to resemble those of their age peers in the general society. However, the medical students were significantly less likely to be current users of marijuana, cocaine, and cigarettes than their contemporaries. Because the college graduates in the comparison sample held an intermediate position between age-related high school graduates (highest rates of use) and medical students (lowest rates), the observed differences may be more the result of increasing education, socioeconomic status, or self-selection of those choosing professional life than of medical student status alone.

2. The medical students reported somewhat higher rates of alcohol and tranquilizer use in the previous year and month than their age-related cohorts.

3. The rates of use for the other major substances were low for both medical students and the national sample. The medical students' experience with amphetamine-type substances appears especially low (27 percent) when compared with medical student surveys of two decades ago, when Smith and Blachly (2) reported 44 percent as using them in their lifetime and Watkins (3) reported 54 percent.

4. Daily substance users are of particular interest, as they would seem to be at greatest risk for substance dependence and impairment. In this category, there was more daily alcohol use by the medical students (9 percent) than by the college (4 percent) or high school graduates (8 percent). It should be remembered, however, that the present survey was taken during the last weeks of medical school and may reflect the examination stress and/or party spirit of that period. Although 1.2 percent of the medical student respondents reported daily marijuana use, this figure was much lower than the figures for the college (3.8 percent) and high school graduates (7.6 percent). Cigarettes, the third and only other substance to be used daily, showed dramatically lower rates among the medical students. The relatively low rates of daily use in this medical student sample also suggest low rates of drug dependence at this stage of their careers.

Perhaps the most encouraging finding in this study is the extremely low rate of cigarette use at the time of the study. It cannot be determined whether this was a result of education about cigarette smoking on the broadest level, a specific effect of medical school education including clinical experience with the pathological effects of smoking, or some combination of the two. Nevertheless, it does suggest that similar campaigns against alcohol, marijuana, and cocaine use might conceivably produce similar results.

Data on the medical students' sources of information about such substances also point to a need for increased attention in medical school curricula. The students learned much about opiates, barbiturates, amphetamines, and tranquilizers in their courses, as these drugs are or have been important elements in the therapeutic armamentarium. However, the two most abused substances in the survey (alcohol and marijuana) are not used in clinical practice, and the data suggest that students look outside the medical curriculum to learn about them. The use of alcohol, marijuana, and cocaine might be considerably different if these substances were given emphasis comparable to that given opiates, tranquilizers, antibiotics, and antihypertensive medications. In this regard, efforts to improve substance abuse education for medical students and house staff members are encouraged. There is clearly a need to teach medical students about substance abuse and to evaluate the impact of such instruction.

The medical students' attitudes toward physicians who use drugs were not global and stereotyped; rather, they appear to be based on judgments about the relative risk of the specific substance and the frequency of use. The data contain some hopeful signs that these young members of the profession view physician drug use as a serious matter. They did not accept regular use of any of the substances by physicians and rejected even experimental use of the more dangerous drugs. Their responses suggest that they would support substance abuse programs for impaired physicians that combined treatment with varying degrees of sanctions, depending on the drugs of dependence and severity of impairment.

Finally, the study reported here raises policy issues that should be addressed. The authors believe that the results of such research should not be used to sensationalize medical students' substance use or to institute unreasonable policies and restrictions. Rather, such studies should suggest ways to improve medical school programs and to identify medical students and young physicians at risk for drug dependence so that early preventive and rehabilitative intervention can occur.

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# DATAGRAM: Substance Abuse Policies and Programs at U.S. Medical Schools

Since the 1960s there has been concern over increasing rates of substance use and abuse in the population, especially among young people. Although chemical dependency and impairment among physicians should be considered serious at any level, thus far there has been a lack of reliable data on the use and abuse of such substances among members of the medical profession (1). Elsewhere in this issue, Conard and colleagues report that cumulative lifetime experience with various drugs and controlled substances among medical students is similar to that of the general population, a not-unexpected finding. However, those authors report figures for daily, monthly, and annual use among medical students that appear to be significantly lower than comparable figures for such use among age-related groups of high-school and college graduates, except for alcohol and tranquilizers.

In addition, studies by Maddux and colleagues (2) and Clark and colleagues (3) suggest that patterns of substance use and abuse generally antedate admission to medical school. Clark's group also showed that alcohol use quantitatively declined during medical school, especially during the clinical years.

Encouraging as these figures are, it is clear that if substance abuse is to be prevented among members of the profession, medical schools have a responsibility to establish clear guidelines and policies defining appropriate professional behavior, especially regarding the use of alcohol and drugs. They also need to take responsibility for designing programs of prevention, identification, and rehabilitation for potential abusers. As if this was not sufficient stimulus, several states, as well as Section 487(10) of the recent reauthorization of the Higher Education Act of 1965, have mandated that institutions of higher education have in place policies and programs relating to substance abuse.

## Methods

To determine the extent to which U.S. medical schools have substance use and abuse policies and programs, in March 1987 a letter and 12-item questionnaire were mailed to the offices of student affairs of all 124 U.S. medical schools, with the exception of those located in Puerto Rico. A follow-up letter and questionnaire were mailed in July to nonrespondents. The questionnaire sought to secure data on the existence and nature of policies and procedures for identification, treatment, and prevention of substance abuse and whether these were formal or informal, written or unwritten.

## Results

Responses were received from 94 schools (76 percent), with one of these schools declining to complete the questionnaire. Cross-tabulations were done using the standard U.S. census regions used by the American Medical Association.

The responses are displayed in Table 1. These data indicate that only 22 percent

**TABLE 1**

**Numbers of U.S. Medical Schools, By Region and By Public or Private Status, with Policies and Programs for Identifying and Treating Substance Abuse by Students, 1987***

| Region/Type | No. Surveyed | No. Responding | Had No Policy or Program | Had Formal Policy | Had Formal Identification Program | Had Treatment Program | Were Planning a Program |
|---|---|---|---|---|---|---|---|
| Region | | | | | | | |
| New England | 8 | 6 | 2 | 1 | 1 | 1 | 2 |
| Middle Atlantic | 21 | 12 | 7 | 1 | 0 | 0 | 3 |
| East North Central | 19 | 15 | 10 | 1 | 1 | 1 | 9 |
| West North Central | 13 | 11 | 8 | 1 | 1 | 1 | 7 |
| South Atlantic | 24 | 16 | 8 | 6 | 4 | 2 | 5 |
| East South Central | 9 | 7 | 2 | 4 | 3 | 2 | 0 |
| West South Central | 14 | 13 | 7 | 3 | 3 | 2 | 8 |
| Mountain | 4 | 2 | 2 | 0 | 0 | 0 | 0 |
| Pacific | 12 | 11 | 6 | 3 | 2 | 2 | 4 |
| Total | 124 | 93 | 52 | 20 | 15 | 11 | 38 |
| Type | | | | | | | |
| Public | 74 | 58 | 31 | 14 | 11 | 7 | 21 |
| Private | 50 | 35 | 21 | 6 | 4 | 4 | 17 |

* All 124 U.S. medical schools (but not those in Puerto Rico) were sent questionnaires; 94 responded, and one of these declined to participate.

of the responding schools had a written policy on medical student impairment, while an additional 28 percent had informal or unwritten policies. The fact that 41 percent of the schools were interested in developing such policies indicates a growing awareness of the need for them.

## Discussion

The relatively low number of schools reporting formal substance abuse policies and programs in this study appears to be in line with data gathered in a recent (unpublished) national survey of substance use and abuse among 2,047 senior medical students in 23 regionally distributed medical schools. Only 25 percent of the students responding to that survey were aware of any policy on substance abuse at their institution. In addition, Jonas and Etzel (4) recently reported that only 32 percent of 126 U.S. medical schools responding to a question on Part II of the Liaison Committee on Medical Education questionnaire in 1988 claimed to have a written policy on substance abuse.

Employee assistance programs in industry and business have found that the most important initial step in preventing impairment is to have formal policies and programs on substance-abuse identification and treatment. Indeed, all 50 states now have organized impaired-physician committees or equivalent structures. That only 22 percent of the respondents to the present survey, or some 16 percent of all U.S. medical schools, reported having a formal policy for identification and treatment of substance use and abuse by medical students suggests that medical students are not receiving adequate or appropriate direction concerning this aspect of professional conduct and behavior and that American medical schools could be in violation of new federal and state guidelines.

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# Survey on Curriculum Committees At U.S. and Canadian Medical Schools

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**Abstract**—A 27-item questionnaire was sent to 144 U.S. and Canadian medical schools to identify prevailing patterns in the organization, philosophy, and function of curriculum committees. Overall, 76 percent responded, with 67 percent of the respondents being school administrators and 33 percent being faculty members. Fifty-one percent rated their school's committee as exerting a significant impact on the educational program over the previous five years. Fifty-six percent of the committees had a routine procedure for course review and used data from multiple sources when conducting curriculum evaluations. The committees that annually received a specific assignment from the dean were the most likely (91 percent) to be rated as having a significant impact, followed by committees that conducted frequent course reviews (66 percent). Thirty-eight percent of the committees were primarily faculty oriented, 29 percent were decidedly administrative in composition, and the remaining committees exhibited a mixture of membership.

The report of the Project Panel on the General Professional Education of the Physician (GPEP) (1) focused attention on the process of educational decision-making in medical school. Although their information is primarily anecdotal, the present authors feel that a number of medical schools have been prompted by the GPEP report to assess not only the nature of their curriculum but also the instructional implications of a health care system which has become increasingly competitive, cost conscious, and corporate-like in structure. For example, Vanselow and Kralewski (2) described several organizational trends in health services that are already influencing the education of medical students: the emergence of corporate hospital systems; the rapid increase in multispecialty group practices; the growth of health maintenance organizations (HMOs), and the increase in numbers of physicians who are salaried employees. The first three developments have restricted patient referrals to teaching hospitals and shortened length of stay, thus placing strain on the traditional educational patterns of clinical clerkships. The fourth change has strong implications for job placement since HMOs are now employing over 25 percent of all physicians not working for the federal government (3). In addition to these

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changes, there is also recognition among medical educators that the size and characteristics of the applicant pool may be changing, with unpredictable effects upon the medical school curriculum.

As a consequence of these changes in the health care system, education decision-makers in medical schools face the dual problem of responding to the standard issues of course content, curriculum density, and course sequencing and to the forces that may substantially reshape the health care environment. The manner in which medical schools analyze their curricula in light of these internal and external factors and make adaptive changes will be critically important to the appropriateness and quality of medical student training in coming years. Presumably, curriculum committees will be in a position to exert a substantial influence on this process in either a positive or negative manner. For instance, Siu (4) and colleagues reviewed modifications in the curricula of medical schools and concluded that most modifications were short-term programs that did not address critical issues. They urged curriculum managers to take a more radical approach to curriculum revision.

An abundance of textbooks are available on the theories and heuristics of curriculum planning and/or evaluation, and a series of monographs (5–7) is directed at curriculum issues in medical education. There is also substantial literature on the dynamics of organizational change (8, 9). However, only a few researchers have examined the relationship of the curriculum committee to campus decision-makers such as the dean, department chairpersons, and influential senior faculty members. Hefferlin (10) and Bucher (11) studied the complex set of environmental conditions that affect the fate of proposed educational reforms. Both authors emphasized the critical role played by administrators during the process of winning support for an innovation and during implementation. Burg and colleagues (12) described a system for managing curriculum revision in medical school which involves a high degree of sensitivity to organizational, political, and communication issues.

Kuske and colleagues (13) evaluated the nature and methods of curricular change in 40 southern medical schools just prior to the publication of the GPEP report. The curriculum committees at these institutions played a substantial role in originating proposals for change and as a mechanism for discussion, but veto power most commonly rested with the dean and department chairmen. This study also documented the types of curricular changes implemented, the reception by faculty members and students, and the degree of subsequent support from decision-makers. Harden (6, 7) discussed a number of curriculum management issues and the merits of various patterns of involving faculty members in the review process. Ewan (14) analyzed the success and failure of curriculum reforms in terms of institutional barriers to change. Finally, the Executive Council of the Association of American Medical Colleges recommended that the curriculum committee should be composed exclusively of department chairmen rather than elected and/or appointed faculty members or course coordinators (15).

## Methods

Because of the paucity of data about curriculum committee operations and their influence in decision-making, the present authors developed a questionnaire to identify national trends and practices that would be useful to medical school administrators, curriculum managers, and faculty members as they establish mechanisms for program evaluation. The questionnaire addressed four areas: organization and membership; philosophies of the role of the curriculum committee; performance of tasks endorsed by curriculum specialists as essential to proper planning and/or evaluation; and the relationship between perceptions of a curriculum committee's impact and a number of variables, including orientation and composition of the committee, curriculum review procedures, the dean's annual charge to the committee, and the presence of educational psychologists on the committee. The questionnaire concentrates mainly on the structural and procedural aspects of curriculum committees and does not address important political issues such as consensus-building or the give-and-take bargaining among departments. The questionnaire also does not directly address informal sources of power within the institution. These informal power sources can include trusted administrative assistants in the dean's suite who exert influence beyond their position, faculty members who have established a personal relationship with the dean or a chairman, networks of respected senior faculty members whose opinions are sought on important issues, and directors of support services (library, student services, laboratories) who can exert influence by controlling facilities and personnel. All of these factors (consensus-building strategies, departmental bargaining, and informal power) can stimulate or stifle curricular modifications. These variables will be explored in a follow-up study by interviewing key participants in curriculum planning at a representative sample of medical schools.

A 27-item questionnaire was drawn up in the summer of 1986 based on the concerns and questions of curriculum committee members at the University of Texas Medical School at San Antonio. A forced-choice format was employed, with respondents being requested to check applicable options listed below each question. A write-in section followed each question to allow for amplification. A final, open-ended essay item was included to obtain viewpoints on issues not directly addressed by the other questions. The questionnaire was critiqued by curriculum committee members and by four educational psychologists experienced in questionnaire design and curriculum development.

Following modifications, the investigators conducted a pilot test of the questionnaire at 14 medical schools. The questionnaire was mailed in October 1986 to the dean, the associate dean for academic affairs, and the curriculum committee chairperson at each of the schools. At least two individuals responded from each school (overall, 30 of the 42 recipients). Comparisons of these responses indicated a high degree of consistency among the different respondents at 13 of the 14 schools. Based on this finding, the investigators concluded that the final questionnaire could be sent to the associate dean for academic affairs at each school with directions that the questionnaire could be forwarded to either the dean or curriculum committee chairperson if these individuals would be in a better position to respond.

After further editing based on the pilot test, the investigators mailed the questionnaire in March 1987 with a cover letter and a stamped, preaddressed return envelope to 128 medical schools in the United States (including one school on provisional status) and 16 schools in Canada. A total of 113 responses were obtained of which 109 were usable (76 percent). Approximately two-thirds of the respondents were from the dean's office (dean or associate dean) and the remainder were faculty members (most commonly the curriculum committee chairperson) and educational consultants (five questionnaires were completed by educational consultants employed by the medical schools).

Chi-square analysis was used, when appropriate, to assess the responses. The responses were also analyzed in terms of the age of the school (those created since 1967 and those older) and their location (U.S. schools versus Canadian schools). The age of medical schools was examined to see whether perceptions of the curriculum committees at the recently created schools, with still evolving curricula, differed from the perceptions of curriculum committees at well established schools. The Canadian medical schools were analyzed as a separate group because many of these schools have five-year programs based on the type of curriculum found in European medical schools.

## Results

The resulting data are presented according to the major themes of the questionnaire: organization, membership, philosophy, performance of curriculum planning and evaluation tasks, and perceptions of a committee's impact. In the following presentation of the results, all responses are based on the number of medical schools that had an active school-wide curriculum committee ($n = 105$) unless a different number of schools is specified. All percentages have been rounded to the nearest whole number.

### ORGANIZATION

Sixty percent ($n = 66$) of the responding institutions had only a single, school-wide curriculum committee that dealt with the entire curriculum. Thirty-six percent ($n = 39$) had separate committees for each year in the curriculum as well as a school-wide curriculum committee. Thus, a total of 105 respondents indicated that their medical school had a school-wide curriculum committee that either functioned alone or in conjunction with other curriculum committees set up for each curriculum year. Three medical schools had curriculum committees for each academic year but did not indicate that their school had a school-wide curriculum committee. One respondent reported that their medical school did not currently have an active curriculum committee of any type. Approximately 70 percent of the 105 schools with a school-wide curriculum committee reported that their committee functioned as an independent committee, while the remaining 30 percent reported that theirs were subcommittees of other campus organizations, most often the faculty council or the school executive committee.

Many respondents supplied write-in comments to supplement their answers to the organizational questions. The most frequent comment was that the freestanding curriculum committees were autonomous only in theory; in practice, one or more other campus groups wielded both formal and informal veto power over committee proposals or were capable of tabling and/or altering a curricular recommendation.

Chairpersons of these 105 school-wide curriculum committees were most commonly faculty members appointed by the administration (38 percent) or an academic dean (24 percent); in 20 percent of these schools, the curriculum committee elected one of its own members as the chair; and in the remaining 18 percent, the faculty senate elected or appointed the chairperson, usually after consultations with the dean's office. The chairperson had a permanent appointment or served for an extended period of time at the dean's discretion in 66 percent of the 105 institutions responding to this question; the chairperson changed annually at 34 percent, and in these schools the chairperson was almost always a faculty member (33 of the 36 schools). Medical schools created in the past 20 years ($n = 34$) were less likely to have an administrator chair the curriculum committee than schools created before 1967 (12 percent versus 29 percent). The school-wide curriculum committees received a specific charge or assignment annually from the dean or another administrator in 32 percent of the 106 schools responding to this question; 46 percent responded that the committee received a charge only as the need arose; and 22 percent reported that the dean did not designate a task or problem for the committee to act upon during the year. The school-wide curriculum committees most commonly met once a month (55 percent); 19 percent met less frequently (for example, quarterly); and 26 percent met at least twice a month.

### MEMBERSHIP

Table 1 shows the categories of membership in school-wide committees. Membership data were difficult to report since there were a number of overlapping categories. However, several patterns are evident. Students were frequently represented on the school-wide committees (in 82 percent of the schools as voting members). School administrations had substantial influence in many committees. Virtually all the respondents reported several administrators serving as ex-officio members, and more than one-third re-

**TABLE 1**

**Percentages of Curriculum Committees at 105 U.S. and Canadian Medical Schools That Contained Members From Each of 15 Categories, 1987**[*]

| Categories | Official Voting Members | Ex-Officio Nonvoting Members |
|---|---|---|
| Students | 82 | 7 |
| Course directors | 50 | 7 |
| Administrators | | |
| All academic deans | 38 | n/a |
| Dean | n/a | 21 |
| Associate dean for academic affairs | n/a | 48 |
| Associate dean for clinical affairs | n/a | 10 |
| Associate dean for students | n/a | 34 |
| Faculty members | | |
| Appointed by dean | 31 | 0 |
| Elected by colleagues | 31 | 0 |
| Appointed by department chairpersons | 16 | 0 |
| Department chairpersons | 35 | 1 |
| Department educational coordinators | 26 | 0 |
| Educational psychologists | 19 | 23 |
| Director of admissions office | 40 | 8 |
| Director of student affairs office | 15 | 11 |
| Other[†] | 15 | 15 |

[*] Questionnaires were sent to 144 medical schools in the United States (128) and Canada (16).

[†] Alumni, library director or librarians, community physician, university registrar, representatives from schools of allied health, dentistry, nursing and pharmacy, and representatives from county medical society.

ported that academic deans and department chairpersons served as regular voting members. Course directors and department education coordinators were reported as members by 76 percent of the respondents, although in many departments one individual held both positions simultaneously. Educational psychologists participated in 19 percent of the committees in voting capacities and 23 percent of the committees as ex-officio members. The Canadian medical schools were the most likely (75 percent) to include an educational psychologist or instructional specialist on the committee, while the recently established (20 years old or less) U.S. medical schools were the least likely (14 percent). The recently established schools were also less likely to include course directors (35 percent) and administrators (26 percent) than the older schools, which reported course directors serving on 57 percent of curriculum committees and administrators serving on 44 percent.

Overall, three general patterns of membership were evident for the school-wide curriculum committees: (*a*) committees chaired on a permanent basis by an administrator and primarily composed of deans and department chairpersons; (*b*) committees chaired by elected and/or appointed faculty members, who usually serve one-year terms, and composed of faculty members; and (*c*) committees between these two extremes (containing a mixture of administrators and faculty members). Thirty of the schools (29 percent) demonstrated a pronounced administrative orientation to their curriculum committee, 40 appeared to have a predominant faculty orientation (38 percent), and the remainder fell into the middle category (33 percent).

In the 42 schools reporting the existence of separate curriculum committees for each curriculum year, membership on these yearly committees consisted mainly of course directors (71 percent) and students (60 percent). The chairperson was generally a faculty member (about 80 percent).

### ROLE AND PHILOSOPHY

There was considerable agreement about the role and philosophy of the school-wide committee: 86 percent indicated that their schools' committees were primarily concerned with planning and/or monitoring the broad scope of the teaching program, while 57 percent indicated that reviewing proposals for new courses and/or course revision plans was a prime committee role. Less than 20 percent reported that the school-wide committee was involved in the day-to-day details of scheduling and monitoring individual courses. Only 14 percent felt that the school-wide committee at their school should primarily function as a forum for faculty discussion of general curricular issues. Only 3 percent felt that the school-wide committee should serve as a special advisory group to the administration for curricular issues.

Committees established for each curricular year dealt much more directly with scheduling and logistical issues than the school-wide committees. For example, over 50 percent of the yearly committees were involved in setting course and examination schedules, reviewing the number of classroom hours and course credits, and responding to student grievances regarding schedules, tests, and logistics.

### CURRICULUM TASKS

Table 2 shows the tasks that the school-wide curriculum committees undertook routinely. The respondents indicated that reviewing proposals for new courses or clerkships (86 percent) and setting general educational policy (79 percent) were the

**TABLE 2**

**Percentages of School-Wide Curriculum Committees at 105 U.S. and Canadian Medical Schools That Performed Various Tasks Related To Curriculum Management and Evaluation, 1987***

| Tasks | Percentages |
|---|---|
| Reviewing proposals for new courses and/or clerkships | 86 |
| Setting general educational policy for the school | 79 |
| Evaluating courses and/or clerkships | 69 |
| Determining appropriate course hours and course credits | 54 |
| Considering faculty grievances about curricular issues | 53 |
| Reviewing NBME scores | 45 |
| Conducting institutional self-study for accreditation | 43 |
| Setting course and examination schedules | 37 |
| Considering student grievances about the curriculum | 37 |
| Analyzing student performance | 24 |

* Questionnaires were sent to 144 medical schools in the United States (128) and Canada (16). A total of 109 schools responded, and 105 of them had school-wide curriculum committees.

two primary tasks of the school-wide curriculum committee. However, a large number of respondents ($n = 73$) also indicated that course evaluation was a primary committee task; 59 of these 73 schools reported that they had created a systematic procedure for formal review of the curriculum at regular intervals. In 28 of these schools, some form of curriculum review occurred annually. Of the 73 schools undertaking course review, 58 reported that directors of courses with identified deficiencies were expected to submit to the curriculum committee a formal reply, either in person or in writing, which addressed the cited problems. When the school-wide committee identified problems with a course and recommended changes, this information was also commonly sent to the department chairperson (56 of the 73 schools) and to the associate dean for academic affairs (46 of the 73 schools).

Data from the 59 schools reporting an established course review procedure indicated that multiple sources of information were commonly examined in this process. Table 3 depicts the frequency of use for various data sources for these 59 schools. Student ratings were employed almost universally by these schools (55 of 59). In contrast, alumni ratings and review by external consultants were used at only a small percentage of these 59 schools.

All respondents, whether or not they considered course review to be an appropriate committee task, were requested to indicate the activities which they felt the school-wide committee should undertake in the future. These responses are presented in Table 4. Three future tasks stood out: developing a systematic procedure for course review (32 percent), defining overall curriculum objectives (30 percent), and designating core curriculum material (29 percent). Very few respondents were interested in obtaining alumni evaluations of the curriculum (4 percent), becoming more involved in the mechan-

**TABLE 3**

**Percentages of School-Wide Curriculum Committees at 59 U.S. and Canadian Medical Schools That Use Various Sources in Reviewing Courses, 1987***

| Sources Used To Review Courses | Percent |
|---|---|
| Student ratings of courses | 93 |
| Self-assessment by course directors | 68 |
| Interviews with faculty members | 66 |
| Peer review of syllabus, tests, and lectures | 63 |
| Student performance in courses | 63 |
| Interviews with students | 59 |
| Student performance on NBME examinations | 58 |
| Analysis by external consultants | 14 |
| Alumni feedback | 14 |
| Comparisons with other schools | 7 |

* Questionnaires were sent to 144 medical schools in the United States (128) and Canada (16). A total of 109 medical schools responded, and 59 of them had a school-wide curriculum committee that had developed a procedure for systematic course review.

**TABLE 4**

**Percentages of School-Wide Curriculum Committees at 105 U.S. and Canadian Medical Schools That Wish To Undertake Various Tasks in the Future, 1987***

| Tasks | Percent |
|---|---|
| Develop course review system | 32 |
| Define overall curriculum objectives | 30 |
| Identify core curriculum material | 29 |
| Communicate curricular issues to faculty | 19 |
| Conduct regular course reviews | 18 |
| Obtain more input from faculty | 15 |
| Increase use of NBME scores in curriculum review | 7 |
| Increase involvement in course scheduling | 5 |
| Increase alumni input | 4 |
| Increase student input | 1 |

* Questionnaires were sent to 144 medical schools in the United States (128) and Canada (16). A total of 109 schools responded, and 105 of them had school-wide curriculum committees.

ics of curriculum operation (5 percent) or obtaining broader faculty input into curricular decision-making (15 percent).

## PERCEPTIONS OF IMPACT

Overall, 51 percent (53 of 105) of the respondents indicated that their school-wide curriculum committee had exerted a "significant" impact over the previous five years, with the remainder divided among "moderate," "minimal," and "no tangible" impact. Cross-tabulation of the questionnaire data revealed the following: (*a*) the impact of committees with an administrative orientation was more likely to be perceived as significant (20 of the 30 schools) than faculty-oriented committees (16 of 40) or committees with a balance between faculty and administrative influences (17 of 35); (*b*) the presence of an annual charge from the dean was correlated to perceptions of significant impact (91 percent of the school-wide curriculum committees that received an annual charge from the dean were seen as having a significant impact versus 32 percent of those committees not routinely receiving such a charge); and (*c*) 66 percent of the school-wide curriculum committees rated as having a significant impact reported an established course review procedure whereas 44 percent of the committees rated as having lower impact reported having created such a procedure.

Of the 16 faculty-oriented committees perceived as exerting a significant impact, 14 reported use of a routine procedure for course review. Two of the 24 faculty-oriented committees rated as having lower impact reported the use of a course review procedure. In addition, 11 of the 20 administration-oriented committees that were rated as having a significant impact reported development of a course review procedure. Of the 10 administration-oriented committees that received lesser ratings of impact, two reported that a course review system had been implemented. Curriculum committees in the Canadian medical schools received a higher percentage of significant-impact ratings (9 of 12 schools; 75 percent) than medical schools in the United States (44 of 93 schools; 47 percent).

## Discussion

Individuals who have served on curriculum committees for a number of years may be surprised by the results reported here. The often-expressed conventional wisdom about curriculum committees is that, more often than not, they are primarily arenas for interdepartmental fighting over classroom and laboratory hours in the preclinical years and the numbers of weeks allocated to each department for clerkships in the third and fourth years. Reid (16) discussed the obstacles likely to be encountered when faculty members or administrators attempt to move the curriculum committee beyond the focused interest of individual members to a broader view of the entire curriculum. Harden's (7) famous quotation, "It is more difficult to change a curriculum than to move a cemetery," aptly reflects the pessimism often heard at medical education meetings when the topic of curricular innovation is mentioned.

In contrast to these negative perspectives, the results reported here indicate that many medical school curriculum committees are seen as a positive influence. Although the questionnaire was limited in scope, some of the outcomes are enlightening and should serve as a foundation for further investigation. In accordance with the recommendations of curriculum specialists (5–7), more than 50 percent of the responding schools appear to have made a commitment to formal curriculum evaluation by developing review procedures that involve the analysis of data from several sources. The definition of what exactly constitutes a systematic course review procedure may vary, and a degree of subjectivity was undoubtedly present in the responses to these questions. But it was apparent that two essential components—establishing a regular evaluation cycle and collecting data that reflect several perspectives—were employed by the schools that said they had created such a system. The data suggest that many of these schools attempted to apply the review process in an active manner rather than taking a passive posture and waiting for problems to arise. Many of these committees were trying to maintain at least a degree of curricular accountability as evidenced by the number requiring a formal response from course directors when the committee pinpoints an education problem.

The data on use of course review procedures suggests that development of such a system is linked to perceptions of committee impact. Only 16 of the 40 faculty-oriented committees were rated as having a significant impact; but of these 16, 14 reported the use of course review procedure. Only two of 10 administration-oriented committees that received lesser impact ratings had developed a course review system. However, more than half of the 20 administration-oriented committees that were highly rated reported the development of a course review procedure.

Two-thirds of the respondents were administrators, and many probably had a significant involvement in the affairs of the school-wide curriculum committee. This fact cannot be overlooked when considering the results, especially since the committees with a pronounced administrative orientation tended to be rated higher than the faculty-oriented committees in having an impact. To check for potential bias on the part of the administrator respondents, the authors compared the response patterns of administrators and faculty members on a number of items, including the impact question. The results showed that the administrators were less optimistic about the value of their schools' curriculum committees than the faculty members. Most of the faculty members who received a questionnaire were curriculum committee chairmen, and they may also have had a built-in bias that skewed the ratings of significance upward. However, the fact that a number of committees of both types were judged to be of limited value suggests that the respondents were willing to be critical of their committee.

Analysis of the open-ended comments provided by the respondents to amplify their answers revealed four persistent themes. Many commented on the need to restructure the traditional departmentally based curriculum committee into a smaller or more task-oriented group. Three schemes were proposed: creation of an executive curriculum committee composed of a core group of six to seven individuals with a strong interest in curriculum planning and/or review; establishment of curriculum subcommittees for each curricular year of the program; and use of administratively appointed review committees that would periodically evaluate the teaching program independent of the curriculum committee.

A second theme that emerged from the open-ended responses was the desire to increase the involvement of course directors in overall planning. Since these individuals are the ones most affected in the educational program in terms of time, effort, and responsibility for student progress, it was argued that they should be the nucleus of the curriculum planning process rather than elected or appointed faculty members, who may have limited involvement in the undergraduate medical curriculum, particularly in regard to the third and fourth years. It is evident from the responses to questions about membership that many schools were considering this idea.

The third theme of the open-ended comments was expanding on the focus of the curriculum committee into the third and fourth years. Curriculum committees have traditionally concentrated on the preclinical years, since classroom courses lend themselves more easily to inspection (reading the syllabus) and quantification (counting the number of classroom hours) than the clinical rotations. The latter are sometimes perceived by basic science faculty members to be impervious to close scrutiny because of their lack of traditional classroom structure. The success or failure of efforts to bring the clinical years under the scrutiny of a curriculum committee would be an inviting area for additional research.

Finally, the critical need for leadership in curricular matters was highlighted by many respondents. One of the most striking results of the study reported here was the very strong correlation between the perceptions of committee impact and a specific charge or assignment provided to the committee by the dean. Thirty-one of the 34 committees receiving an annual charge from the dean were considered to be very successful. It can be hypothesized that the dean's charge focuses energy on key problems and provides a schedule for action. Many of the respondents commented on the importance of these two attributes—key problems and a schedule—particularly when attempting to energize a committee that has played a passive role in curricular affairs so that it takes a more active posture. Twenty-six committees both received an assignment each year from the dean and employed an annual course review system examining a specific phase of the curriculum. Of these, all but three were considered to have significant impact. One interpretation is that the dean's charge provides committee members with a sense of purpose, while the course review system provides a built-in mechanism the committee can use to gather the information needed for thoughtful decision-making. If a high percentage of the membership of the committee is replaced annually and the chairperson rotates among members, having a charge from the dean and a protocol for conducting course reviews may provide the structure needed to ensure continuity.

There was a high degree of philosophical agreement that the main role of the curriculum committee should be to plan and monitor the broad scope of the instructional program. Only a few responders felt that the committee should be involved in the daily logistics of curriculum operation or serve merely as a forum for general discussion without involvement in planning or implementation. However, a number of the respondents suggested in open-ended responses that the dividing lines between developing, implementing, and monitoring curriculum policy had become hazy in their schools, a situation which contributed to confusion about the committee's role.

Virtually all of the school-wide curriculum committees had administrators as either official or ex-officio members. However, the number of administrators on these committees varied widely: ranging from committees that had a few administrative personnel participating as ex-officio observers to committees that were primarily composed of deans, department chairpersons, and the directors of various academic support services such as the registrar's office and the library. In terms of organizational issues, the varied number and role of administrators on curriculum committees was the most striking finding. Because of their committee membership and their process for selecting a chairperson, 40 of the responding schools evidently perceived the curriculum committee to be a faculty responsibility, while 30 schools had committees that appeared to be an administrative arm of the dean's office. It was interesting to note that a higher percentage of the new medical schools had faculty-oriented committees than did the schools created before 1967. While the data suggest that either organizational format (administration-oriented or faculty-oriented) can produce a committee perceived as having significant impact, the administratively oriented committee may find its task easier. The task may be easier because an administratively oriented committee has the ability to combine policy-making and implementation, while a faculty-oriented committee may need to rely on other groups and individuals to convert its policies into action and then make sure that they are implemented as planned.

In regard to the functions of curriculum committees, the respondents were clearly not interested in obtaining more input from alumni or from external consultants such as HMO leaders. This attitude was surprising in light of the uncertainty and changes in many parts of the health care system. Alumni who deal with these changes firsthand may be able to provide guidance that would enhance program relevancy. A recent study by Jacobs and Mott (3) demonstrated that HMO administrators have definite opinions about the skills that should be emphasized in medical school and residency training. Their survey of 168 HMO medical directors revealed that cost-effective use of diagnostic and treatment services, skills in utilization review and quality assurance, adaptability to change, bedside manner, comfort with a team concept, and clinical experience in an ambulatory setting were high priorities when recruiting physicians. Clinical experience in an inpatient setting was considered to be of relatively low priority. Additionally, their survey indicated that the HMO leaders' concerns about medical education were strikingly similar to some of the issues raised in the GPEP report: the curriculum should direct more attention to environmental and life-style factors, the problems of poverty and malnutrition, coping with ethical dilemmas, and the need for physicians to learn how to use community health services.

The respondents in the present study also had little interest in increasing student involvement or obtaining greater input from faculty members. These findings were equally true for committees that seemed to take active roles in curriculum evaluation and revision and for committees that did not consider curriculum evaluation to be their responsibility. Apparently, curriculum committees of all types felt they had adequate input and would rather focus their energies on other tasks than on gathering faculty and/or student input. For example, 34 of the 46 schools that did not routinely employ a course review system reported that they would like to create one. Defining overall curriculum objectives, identifying core content, or both were mentioned as desired functions of a curriculum committee by over 50 percent of the responding schools. This finding indicates that these curriculum planning tasks have not been undertaken at many schools but are still seen as priority items by curriculum managers.

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